

January 1981

# Food Technology Abstracts

Phytochemistry  
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Meat Science  
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CANNER  
PACKER  
Perfect  
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Acta Alimentaria  
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Indian Coffee  
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Food Technology  
Indian Journal of Biochemistry & Biophysics  
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APPROPRIATE TECHNOLOGY  
Australian Fisheries  
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Oleagineux



**National Information Centre  
for Food Science and Technology,  
Central Food Technological**

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# **Food Technology Abstracts**

No. 159  
January 1981

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# CONTENTS

	<u>Page No.</u>
1. GENERAL	1
2. FOOD PROCESSING & PACKAGING	2
3. FOOD ENGINEERING & EQUIPMENT	2
4. FOOD CHEMISTRY & ANALYSIS	3
5. FOOD MICROBIOLOGY	4
6. FOOD ADDITIVES	5
7. CEREALS	6
8. MILLETS	8
9. PULSES	8
10. OILSEEDS AND NUTS	9
11. TUBERS & VEGETABLES	9
12. FRUITS	12
13. SUGAR, STARCH & CONFECTIONERY	14
14. BAKERY PRODUCTS	15
15. MILK & DAIRY PRODUCTS	15
16. MEAT & POULTRY	20
17. SEAFOODS	25
18. PROTEIN FOODS	29
19. FRUIT JUICES & BEVERAGES	29
(ALCOHOLIC & NON-ALCOHOLIC)	
20. OILS & FATS	32
21. SPICES & CONDIMENTS	32
22. SENSORY EVALUATION	33
23. FOOD STORAGE	34
24. INFESTATION CONTROL AND PESTICIDES	35
25. BIOCHEMISTRY & NUTRITION	36
26. TOXICOLOGY AND HYGIENE	38

AA Author's Abstract

• Indian Author

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+ Indian Journal

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## GENERAL

- 1 ANON. Conference on Food Science, Budapest, 25-26, May 1978. Acta Aliment. 8(1); 1979; 81-110

Fairly detailed summaries of 27 papers - 16 on proteins, 11 on fats have been presented in this issue. KMD

- 2 BARNA (J). Compilation of bioassay data on the whole someness of irradiated food items. Acta Aliment. 8(3); 1979; 205-315

A review of 1223 studies on the wholesomeness of some 278 different irradiated foods and feeds concerning the period from 1925 to date is presented. The compilation lists the results of the investigated parameters according to food items. The survey of the summarized data leads to the conclusion that neither stimulative nor adverse effects of the consumption of irradiated food are consistent, unambiguous and reproducible. Neither can specific effects be related to a given food, group or level of radiation dose. AA

- 3 BEDINGER (AFG). On solar system performance. Ashrae. J. 22(2); 1980; 44-45

- 4 DEN HARTOG (C). Food, health and farming. Voeding. 40(2); 1979; 41-44 (Swedish)

- 5 ETHIER (RA). The complete specification. J. Food Qual. 3(2); 1980; 87-90

The important points to be observed for quality specification from the raw material and ingredients, packaging material, processing stage, finished product and warehousing and distribution point of view have been covered. KAR

- \*+6 GARG (DO). Remote sensing technology and agricultural management. Seeds. Farms. 6(1); 1980; 41-48

- 7 GIBSON (HJ). Alternate fuels. Cereal Food World. 25(4); 1980; 157-159

The possibilities and the problems involved in the use of alcohols, oil from oil shale, coal and hydrogen have been considered. KAR

8. HARE (LB). The role of statistics in product quality : some examples. J. Food Qual. 3(2); 1980; 67-76

Rising costs, increased "consumerism" and advanced technology have stimulated more interest in probability-based decision making. Two examples, one on fill control in packages and another on skip-lot sampling have been prescribed to bring out the importance of statistics in food industry. KAR

- 9 HICKS (LE). Food safety, quality assurance and the law: FDA as a quality assurance partner. J. Food Qual. 3(2); 1980; 03-107

- 10 JOHNSTON (MR). FDA good manufacturing practice regulations. J. Food Qual. 3(2); 1980; 109-118

- 11 JOHNSTON (PJ). Ethanol - an alternative to its use as fuel. Int. Sugar J. 82(974); 1980; 41-44

- 12 KAMPF (H). Energy from biomass. Int. Sugar J. 82(974); 1980; 39-40

- 13 MacDONALD (JC). Pattern recognition: Portable computer programs for the food industry. J. Food Qual. 2(1); 1978; 1-15

A very brief but practical summary of pattern recognition has been presented. Pattern recognition emphasizes supervised versus unsupervised



methods and the most useful algorithms have been introduced, along with the critical literature references to allow immediate implementation of these algorithms. KAR

- \*+14 RAKESH GULERIA (OS). The emerging picture of the green revolution in India. Seeds. Farms. 6(1); 1980; 27-30
- \*+15 SWAMINATHAN (MS). Indian agriculture in the eighties. Seeds. Farms. 6(1); 1980; 23-26
- 16 ZWARTZ (JA) and HAUTVAST (JGAJ). The contribution of plant breeding to the world food situation. Voeding. 40(3); 1979; 124-128 (Swedish)

## FOOD PROCESSING AND PACKAGING

### Processing

- 17 ROBERTSON (GL). Flow process charts and their applications in food processing. Food Technol. Aust. 32(5); 1980; 268-270

Four basic types of diagrams used for recording information about processes are briefly described. Of these the flow process chart is described in detail and the advantages and applications of such charts in food processing are discussed. KAR

### Packaging

- 18 ANON. Future of the drinks can. Food Manuf. 55(2); 1980; 31
  - 19 ANON. In-store packaging: Two case studies looking at in-store packaging - one of meat, the other of records. Packaging. 51(598); 1980; 14-15
  - 20 ANON. State of the art: flexible packaging reaches for higher barrier. Packag. Eng. 25(3); 1980; 39-43
  - 21 ANON. What's new in packaging? A look at some new packs and installations which have been developed over the past few months. Food Manuf. 55(2); 1980; 47
  - 22 JACOB (NBL), PEDERSEN (LD), ROSE (WW), CARROAD (PA), CHHINNAN (MS) and PAUL SINGH (R). Energy conservation in the canning industry - Part II. Food Prod. Manage. 103(11); 1980; 12-16
- Energy consumption (both thermal and electrical) in different stages of canning of peach and tomato products is given. Energy intensive operations have been identified. KAR
- 23 LCRUSSO (S). Critical considerations on the Italian regulations concerning the production of packaging papers for food. Ind. Aliment. 18(164); 1979; 631-634 (Italian)

## FOOD ENGINEERING AND EQUIPMENT

- 24 ANON. Continuous flow louvred bed driers. Mill. Feed. Fertil. 163(3); 1980; 36 & 38
- 25 ANON. Grain drying, cleaning and handling. Mill. Feed. Fertil. 163(3); 1980; 34-35
- 26 ANON. Microprocessor batch weighing. Mill. Feed. Fertil. 163(3); 1980; 16-23 & 28
- 27 ETCHETO (M). A constant flow rate olfactometer with seven calibrated concentrations. Chem. Senses. 5(1); 1980; 1-19



- 28 TRIBELHORN (RE) and HARPER (JM). Extruder - cooking equipment. Cereal Food World. 25(4); 1980; 154-156

Many new applications have been developed for extrusion equipment in the last ten years. Applications include manufacture of meat analogues, third generation snacks, and textured breakfast foods. KAR

- 29 TRICKETT (S). Economic aspects of pelleting. Mill. Feed. Fertil. 163(3); 1980; 24

## FOOD CHEMISTRY AND ANALYSIS

- 30 CUZZONI (MT) and GAZZANI (G). Method for the separation of nitrite from nitrate useful for their determination in foods. Ind. Aliment. 18(165); 1979; 703-706 (Italian)

A method for the separation of nitrite from nitrate in solution is described. Nitrites are separated from nitrates by distillation of nitrous vapours the distillate is collected in alkaline solution. Distillation speedily, in the absence of oxygen, nitrite recovery is reproducible and higher than 87%; standard deviation 1.4 with coefficient and of variability 1.59. The proposed method is useful for the determination of nitrites and nitrates in foods. AA

- 31 ELSAYED (AM), ELSAYED (YM) and ABDINE (H). Use of an orthogonal function in differential spectrophotometry. Analyst. 105(1248); 1980; 222-226

- 32 FERNANDO (T). Utilization of paunch content material by ultrafiltration. Process Biochem. 15(3); 1980; 7-9

- 33 KEARSLEY (MW), BIRCH (GG) and FOYLE (RAJ). The determination of the iron/chelating ability of different carbohydrates and the preparation of ferric/carbohydrate complexes. Acta Aliment. 8(1); 1979; 69-80

It has been shown earlier that ferric iron, which cannot be transported across the mucosal walls as such, can be carried through the wall in the form of a ferric/fructose chelate and made available to the organism. The authors have found that ferric iron can chelate with a variety of other carbohydrates as well. Some interesting differences between carbohydrates have been brought to light. KMD

- 34 KOLLER (W-D). Apparatus for the continuous extraction of aroma compounds using liquid gas. Food Sci. + Technol. 13(1); 1980; 49-50 (German)

Using an apparatus specially designed for the purpose, the author has extracted aroma compounds from aqueous solutions by means of liquefied gas. The necessary conditions for such an extraction are: (i) that the liquid gas should be insoluble in water; (ii) its density should be lower than that of the aqueous solution; and (iii) the pressure at the working temperature should not exceed the limits determined by the apparatus. The extraction of 4 test substances from an aqueous solution, by means of 1,1-difluoroethane (b.p. -24.7°C) has been described as an example. KMD

- 35 LERICI (CR). Intermediate moisture foods. Ind. Aliment. 18(165); 1979; 695-702 (Italian)

- 36 NEUKOM (H), AMADO (R) and PFISTER (M). New insights into the structure of pectic substances. Food Sci. + Technol. 13(1); 1980; 1-6 (German)

Reviewing some of the recent results of research on pectic substances, the authors conclude that pectic substances seem to be more heterogeneous than was assumed so far. The general assumption that all pectic substances are rhamnogalacturonans has to be questioned. Cell walls of the same plant may contain both pure galacturonans and rhamnogalacturonans,



located in different regions. The structural heterogeneity of pectins is complicated further by the attachment of various types of side chains to the galacturonan or rhamnogalacturonan respectively. KMD

- 37 NINFALI (P), MAGNANI (M), STOCCHI (V) and DACHA (M). Spectrophotometric analysis of interferences due to polyols in the assay of protein by Lowry's method. *Analyst*. 105(1248); 1980; 285-288
- 38 RUEGG (M). Calculation of the activity of water in sulfuric acid solutions at various temperatures. *Food Sci. + Technol.* 13(1); 1980; 22-24 (German)

- 39 SILVA (M) and VALCARCEL (M). Spectrophotometric determination of microgram amounts of calcium in waters and foods using diphenylglyoxal bis (2-hydroxybenzoyl Hydrazone). *Analyst*. 105(1248); 1980; 193-202

The sensitive and selective spectrophotometric method proposed eliminates interference from cations when masking agents are added. The yellow calcium complex formed with diphenylglyoxal bis (2-hydroxybenzoyl Hydrazone) has been used for estimation of calcium in foods. The data obtained has been compared with those obtained from using glyoxal bis (2-hydroxyanil). BSN

- 40 WARREN (RL). Tungsten filament vaporiser and oxyhydrogen flame for optical-emission spectrometry. *Analyst*. 105(1248); 1980; 227-233

### FOOD MICROBIOLOGY

- 41 BIACS (PA). Rapid method for the determination of wild yeast contamination in baker's yeast by lipid analysis. *Acta Aliment.* 8(1); 1979; 57-67
- \*+42 CHANDA (S), CHAKRABARTI (S) and BAGCHI (DK). Propagation of yeast in whey, a by-product from leaf protein production plant. *Curr. Sci.* 49(20); 1980; 793-794

Deproteinised juice or whey collected after complete precipitation of leaf protein was sterilised and stored for propagation of yeast without any additional nutrients. Common yeast culture was aseptically added to the flasks containing whey which were incubated at 28°C for 48 h and growth of yeast cell microorganism was measured. Yeast propagated more or less in all the samples (range  $2 \times 10^{10}$  -  $80 \times 10^{10}$  cells after 48 h) and of the 6 plants investigated turnip produced max. yeast cells. MVG

- 43 DaSILVA (EJ) and DOELLE (HW). Microbial technology and its potential for developing countries. *Process. Biochem.* 15(3); 1980; 2-6
- 44 FINZI (G). Reduction of the ambient microbial load with aerosol. *Ind. Aliment.* 18(166); 1979; 794-796 (Italian)

Referring to earlier experiments, the author discusses the theory and reports experimental data on the control and reduction of the microbial load of air in a confined space, by the technique of aerosolization. KMD

- 45 LAFON-LAFOURCADE (S), LARUE (F) and RIBEREAU-GAYON (P). Evidence for the existence of "survival factors" as an explanation for some peculiarities of yeast growth especially in grape must of high sugar concentration. *Appl. Environ. Microbiol.* 38(6); 1979; 1069-1073
- 46 LAMENDOUR (ML) and PINEL (M). Thermal destruction of the micro-organisms and sterilizing parameters. *Ind. Aliment.* 18(164); 1979; 623-630 (Italian)
- 47 LEE (C) and LIM (H). New device for continuously monitoring the optical density of concentrated microbial cultures. *Biotechnol. Bioeng.* 22(3); 1980; 639-642



- 48 LIN (Y). Use of potassium hydroxide technique for the differentiation of gram-positive and gram-negative bacteria. Brew. Dig. 55(3); 1980; 36-37
- 49 MANNINO (S) and CAVAZZONI (V). Mineral content of Candida yeasts grown on different substrates. Food Sci. + Technol. 13(1); 1980; 34-35

Candida yeasts were grown on different substrates, e.g. n-paraffins, glucose, xylose, ethanol and methanol, and concns. of different minerals (K, Na, Mg, Ca, P, Fe, Zn, Cu, Mn, Co, Cd, Pb, G, Si & S) in the biomass were measured by atomic absorption spectroscopy. The results were compared with the mineral contents of bakers' yeast. In general differences in substrate did not affect the concn. of the various mineral elements in the biomass. KMD

- 50 MAULE (DR). Propagation and handling of pitching yeast. Brew. Dig. 55(2); 1980; 36-40
- 51 PRIMATESTA (G). Cellular membrane as molecular workshop for the biological-nutritional balance. Ind. Aliment. 18(164); 1979; 638-640 (Italian)
- 52 REICHART (O). A new experimental method for the determination of the heat destruction parameters of microorganisms. Acta Aliment. 8(2); 1979; 131-155

The essential point of the new method is that both the heat destruction curve and the Arrhenius plot demonstrating the temperature dependence of the death rate coefficient may be constructed from a single series of measurements carried out in a single system. Thus, neither the age of the culture, nor the composition of the heat treatment medium or of the culturing medium change, so that all interfering factors are eliminated. The method is equally suitable for heat destruction tests above and below 373°K (100°C), and adequately simulates practical sterilization procedures. Results of tests with cultures - of varying age - of *Saccharomyces cerevisiae*, *Escherichia coli*, and *Bacillus stearothermophilus* have been reported. KMD

- 53 WAITES (WM), BAYLISS (CE) and KING (NR). The effect of sporulation medium on spores of *Clostridium bifermentans*. J. Gen. Microbiol. 116(2); 1980; 271-276
- 54 WANG (Y-Y.D.), MILLER (J) and BEUCHAT (LR). *Tetrahymena thermophila* as an organism for bioassay of protein quality. Nutr. Rep. Int. 21(5); 1980; 645-651

It was found that *T. thermophila* may be more promising than *T. pyriformis* W as a biological tool to assess the nutritive quality of protein foods. Nutrients other than protein and non-nutrient ingredients appear to influence growth of the protozoan. The use of turbidity for assuring growth of *T. thermophila* may not work for all types of food products. KAR.

- 55 WOOD (DA). Production, purification and properties of extracellular laccase of *Agaricus bisporus*. J. Gen. Microbiol. 117(2); 1980; 327-338

## FOOD ADDITIVES

- 56 AMATO (P). About a recent nutritive sweetener: The iso-glucose. Ind. Aliment. 18(164); 1979; 635-637 (Italian)
- 57 CANTARELLI (C). Correlations among measurable properties and "flavour". Ind. Aliment. 18(167); 1979; 869-879 (Italian)



The author has outlined the inherent difficulties in correlating measurable properties with flavour and discussed by way of example: (a) various GLC fractions of aroma and intensity of odour; (b) analysis with the help of gas-chromatographic peaks; (c) detection of mixtures of coca-cola and pepsi-cola; (d) substances that determine the flavour of canned meat; (e) detecting by odour, soya protein in meat products, after their sterilization; (f) relationships between perception of sweetness and the viscosity and other physical parameters of various gums; and (g) the influence of temperature and pH on the degree of sweetness. KMD

- 58 CANTONI (C), D'ALBERT (S) and PERLASCA (M). Nitrates, Nitrites, nitrosamines and bacteria. Ind. Aliment. 18(165); 1979; 741-754 (Italian)

Nitrates, nitrites and nitrosamines synthesis by bacteria has been reviewed. Data about nitrite production by Enterobacteriaceae are also furnished. AA

- 59 CORRADI (C) and MICHELI (G). Rapid method of research and identification of the natural colour E 162 in food products. Ind. Aliment. 18(165); 1979; 797-802 (Italian)

A rapid method of extraction of natural beetroot dyes, betanin, in foods using polyamide powder or anion exchanger DEAE-Sephadex for the enrichment is described. Thin-layer chromatography using some solvents permits the identification. AA

- 60 FOGG (AG) and BHANOT (D). Effect of tetraphenylphosphonium chloride on D.C. and differential-pulse polarograms of synthetic food colouring matters. Analyst. 105(1248); 1980; 234-240

Tetraphenylphosphonium chloride (TPPC) exerts pronounced effect on the d.c. and differential pulse (d.p.) of pyrazole azo colouring substances, tartrazine and yellow 2G, and of triphenyl colouring substances Brilliant Blue, FCF, by shifting d.c. half wave potentials and d.p. peaks to move negative potentials. Changes occur in concentrations of TPPC upto  $100 \mu\text{g/ml}^{-1}$ . Over this concentration range half-wave, peak potentials, limiting potentials, limiting diffusions and peak currents change very little. BSN

- \*\*61 VENUGOPAL (JS), HIRANNIAI (BV) and MAJUMDER (SK). A new method of determination of calcium orthophosphate and associated impurities by thermogravimetry and derivative thermogravimetry. J. Food Qual. 2(2); 1978; 135-141

Calcium orthophosphate is a nutritional additive in processed foods and wheat flour; pure salt is highly toxic to insects. To overcome the cumbersome process of analysis a new method of identification of pure tricalcium phosphate and other associated impurities by thermogravimetry and derivative thermogravimetry has been described and the parameters for the identification of the nutritional protectant salt have been characterised. KAR

- 62 WALDROP (M). Firm takes new approach to food additives. Chem. Eng. News. 58(18); 1980; 22-23

Story of a new non-absorbable food additive - Anoxomer developed by California based Dynapol Co. KAR

## CEREALS

- 63 ENGSTROM (A) and KERN (M). Breakfast cereals answers to nutrition and health related issues. Cereal Food World. 25(4); 1980; 144-146

The nutritional controversies surrounding sugar and ready-to-eat cereals do not show signs of abating in the near future. In fact fortified



cereals have a positive nutritional influence on children's diet. KAR

- \*+64 MEHTA (BC), HUKKU (RK) and BHATT (PD). Availability of iron from cereal based diet. Indian J. Med. Sci. 34(5); 1980; 107-110

Availability of iron from predominantly cereal based diet (wheat flour and rice) is poor and this is an important cause of widespread iron deficiency in the group of patients studied. KAR

- \*+65 SAMAJPATI (JN), RAHMAN (S) and CHOWDHURY (TC). Comparative study of low cost grain-storage structures for domestic use in Bangladesh. Indian J. Agric. Sci. 50(6); 1980; 497-501

The performance of currently used grain storages like (i) 'dole' (oval structures of woven bamboo splits plastered with mud and cowdung on both sides), (ii) bamboo reinforced concrete bin (iii) Bukhari-type bins (two concentric, woven, bamboo mat cylinders with the gap between them filled with mud and the out side plastered with mud and cowdung) and (iv) Matkas (burnt clay containers) have been compared by storing for 15 months Nazirsail rice (*Oryza sativa* Linn.) with a moisture content of 13.33%. Data on atm. temp. and RH were recorded daily and data on grain viability, grain moisture, insect infestation and grain damage were determined at the end of each month. Results indicate that loss of viability, quantitative losses and damage by rodents and insects were related to grain moisture, atm. temp. and RH. After 13 months, marked insect infestation were found in (i) (0.1%), (ii) (0.15%) and (iii) (0.02%). Insects were not observed in (iv) but the viability of grain was 0% after 12 months. Of all these structure (i) was found most suitable for storing rice under domestic conditions. MVG

#### Rice

- ✓ \*+66 GOVINDARAO (VH). Utilization of rice husk: A preliminary analysis. J. Sci. Ind. Res. 39(9); 1980; 495-515

An exhaustive review covers: various aspects of rice husk including composition and physical characteristics; use as animal feed; agricultural use; use as fuel; in the preparation of foods; production of organic chemicals; carbon; inorganic chemicals; abrasives; refractory and insulating materials; plastics; pollution control; pressing and filtering aid; and miscellaneous uses in industry; and primary processing of rice husk. MVG

#### Triticale

- 67 AL-HUSAINI (SS) and LORENZ (K). Mechanical debranning of whole kernel triticale II: Nutritional value and sensory evaluation of fractions as rice substitute. Food Sci. + Technol. 13(1); 1980; 30-33

A rice substitute of very satisfactory quality was produced from triticale. Debranned triticale showed a higher nutritive value (protein, essential aminoacids, minerals) than rice. In particular, the lysine content of triticale grain was higher than that of rice, and iron content was almost twice that of rice. Debranned triticales were equally good as rice; they were more tolerant to prolonged cooking, and had lower cooking losses. The bran fractions were very good sources of protein, fibre, and other nutrients. KMD

- 68 LORENZ (K) and AL-HUSAINI (SS). Mechanical debranning of whole kernel triticale. I Proximate compositions and properties of fractions. Food Sci. + Technol. 13(1); 1980; 25-29

Triticale grain and bran fractions were collected after each of five passes through a CeCoCo mill. The percentage of grains remaining were 80.5-48.4% of the original whole grain for the triticale 6-TA-206, and 89.8-46.6% for the triticale TR-385. For the triticale 6-TA-206 grain fractions, protein, ash, fat, and crude fibre A ranged from 14.9-12.6%, 1.5-0.76%, 1.1-0.6%, and 2.0-0.6% resp. depending on the number of runs



through the mill. In long grain rice, lower values were obtained for each of these components. The fifth runs of the two triticales varieties and of the rice had the highest in-vitro digestibility. KMD

- 69 TURBIN (NV). Physiologico-genetic study of yielding ability in triticales. Seeds. Farms. 6(1); 1980; 31-34

Wheat

- 70 KOLOSTORI (M). Flour quality and proteolysis. Acta Aliment. 8(1); 1979; 1-12

## MILLETS

Sorghum

- 71 PRICE (ML), HAGERMAN (AE) and BUTLER (LG). Tannin in sorghum grain: Effect of cooking on chemical assays and on antinutritional properties in rats. Nutr. Rep. Int. 21(5); 1980; 761-767

## PULSES

- 72 QUEMENER (B) and MERCIER (C). Rapid estimation of the ethanol-soluble sugars of legume grains by high pressure liquid chromatography. Food Sci. + Technol. 13(1); 1980; 7-12 (French)

The major carbohydrates identified and estimated in legume grains by HPLC are sucrose, raffinose, stachyose, and verbascose. The smallest quantities that can be detected are 2  $\mu$ g for sucrose, 3  $\mu$ g for raffinose and stachyose, and 5  $\mu$ g for verbascose. The reproducibility of the method is + 2.9%. The speed of separation (20-25 min. instead of 6 h on Bio-Gel P-2) and the ease with which the technique can be applied, make this HPLC method a suitable one for routine analysis. KMD

- 73 GATFIELD (IL). Loss of dry matter during the industrial preparation of legumes: Leaching of trypsin inhibitors from beans during the soaking step. Food Sci. + Technol. 13(1); 1980; 46-48

The inhibitor material leached from Canadian Michigan pea beans during their industrial preparation was partially purified by chromatography on Sephadex G-10 and G-25; estimation of mol.wt on G-100 gave a value of 11,300 + 1000 daltons. Kinetic data indicate a typical non-competitive inhibition mechanism, and the partially purified inhibitor was shown to exhibit a high thermal stability. In the soaking water of peas and lentils, no trypsin inhibitor activity could be detected. KMD

Pea

- 74 GORMLEY (TR), KEVANY (J), O'DONNELL (B) and McFARLANE (R). Effect of peas on serum cholesterol levels in humans. Ir. J. Food Sci. Technol. 3(2); 1979; 101-109

Human feeding experiments have revealed that high density cholesterol levels (HDL cholesterol), as measured at two weekly intervals in male and female volunteers fed 30g of freeze dried peas daily during the period Feb 8 - March 22, were higher in the pea fed group with the effect appearing very significant in them in comparison to the control group. The significance levels of cholesterol and HDL cholesterol persisted even after two weeks after the feeding was stopped, although this did not appear so after 7 weeks. BSN



## Bean

- 75 ANDREOTTI (R), TOMASICCHIO (M), MACCHIAVELLI (L) and SIVIERO (P). Preserved beans from fresh seeds. Ind. Conserv. 54(3); 1979; 213-216 (Italian)

The quality of heat-processed and deep-frozen beans prepared from fresh seeds was compared with that of heat-processed beans prepared from dry hydrated seeds. The bean varieties used were of the "borlotto" type with brown-mottled seeds. The results obtained show that deep-frozen beans prepared from fresh seeds are generally better than canned beans from dry seeds, because the flavour of the former is much the same as that of fresh beans. Canned beans from fresh seeds are generally of lower quality in comparison with those obtained from dry seeds, owing to their less pronounced and sometimes objectionable flavour and their poorer and not very characteristic colour. AA

## OILSEEDS AND NUTS

- 76 Von WANDRUSZKA (RMA), SMITH (CA) and KAYS (SJ). The role of iron in pecan kernel colour. Food Sci. + Technol. 13(1); 1980; 38-39

The reversible colour changes occurring in pecan kernels could be attributed to the iron present in the outer layers of the testa. The kernel colour could be made lighter by exposure to  $\text{SnCl}_2$  and  $\text{H}_3\text{PO}_4$  solutions. The change brought about by  $\text{SnCl}_2$ -treatment could be correlated to surface iron concn. Brief exposures to ammonia vapours were found to give iron-related, reversible darkening in the kernels. Extended exposure to ammonia led to partially irreversible darkening. KMD

## TUBERS AND VEGETABLES

- 77 BAKER (PG), FARRINGTON (DS) and HOODLESS (RA). Fungicide residues. Part VII. Determination of residues of fentin in vegetables and cocoa products by spectrofluorimetry. Analyst. 105(1248); 1980; 282-285
- 78 van der MEER (MA). A relative worth-factor for the evaluation of the vitamin and mineral content of fresh vegetables. Voeding. 40(1); 1979; 12-21

A single parameter - viz. the "relative worth-factor for vitamins and minerals" - is proposed that permits an evaluation of the quantities of the principal vitamins and minerals present in a fresh vegetable, as compared to the quantities of these nutrients present in the "averaged vegetable", i.e. the average of the 47 vegetables from the Dutch food composition tables. This parameter is expressed as:

$$\text{RW(V+M)} = \frac{\text{mg carotene}}{P19} + \frac{\text{mg.vit C.}}{37} + \frac{\text{mg vit B1}}{84} + \frac{\text{mg vit B6}}{185} + \frac{\text{mg vit B2}}{185} + \frac{\text{mg K}}{717} + \frac{\text{mg Fe}}{2.64} + \frac{\text{mg Ca}}{165} \quad 18.75\%$$

The individual terms represent the ratio of the content of a nutrient in the concerned vegetable to its content in the "average" vegetable; moreover each such term is multiplied with a weightage factor which is 1 for carotene and vitamin C,  $\frac{3}{4}$  for vit B1 and B6,  $\frac{1}{2}$  for vitamin B2, K and Fe, and  $\frac{1}{3}$  for Ca. Multiplication with 18.75% makes the score of the "averaged vegetable" 100%. Kitchen herbs (parsley, garden cress, and celery) have the highest RW(V+M) value, namely 175%; for leafy vegetables the value is 115%, and for fruit and root-vegetables 50-70%. KMD



- 79 ZETELAKI-HORVATH (K) and GATAI (K). Use of endo-polygalacturonase to increase the dissolved protein content of vegetable juices. Acta Aliment. 8(2); 1979; 117-130

Solubilization of the protein of several vegetables by endo-polygalacturonase has been investigated as a function of the time of incubation, and of the enzyme concentration. A 1% concentration of liquid enzyme was found best for squash, green pepper, and carrot, the optimum incubation period being 1 h. A 1% concn. of enzyme and an incubation period of 3 h were optimal for red tomato-shaped paprika, celery, and several varieties of carrots, while for red beet the optimal enzyme concn. was 0.1%, and the optimal incubation period 1.5 h. Protein contents of the endo-polygalacturonase-treated vegetable juices increased by 14-50% compared to that of the untreated control. Thus, the enzyme treated vegetable juices contained 72-93% of the protein content of the original tissues. KMD

Tuber

Potato

- 80 LEMMEL (SA), HEIMSCH (RC) and KORUS (RA). Kinetics of growth and amylase production of *saccharomycopsis fibuligera* on potato processing wastewater. Appl. Environ. Microbiol. 39(2); 1980; 387-393

Cassava

- 81 ADEWUSI (SRA) and OKE (OL). The effect of various levels of cassava on protein utilization by rats. Nutr. Rep. Int. 21(5); 1980; 709-715

In the presence of good source of protein, cassava can successfully replace maize starch as a source of energy, contrary to previous findings that weight gain and feed conversion declined with increasing the amount of cassava added to the diet of pigs. The high level of cassava (0-100% level) did not seem to have any marked effect on the feed intake or on the available lysine (7.6-8.35/16gN) when leaf protein from *Amaranthus* was used as sole source of protein at 100% cassava level the PER was low (1.26) but increased to 1.64 on supplementation with 0.2% methionine and the best result was obtained when 50:50 mixture of LPC and cassava was used (PER 2.13), better than casein above. KAR

Bulb vegetable

Garlic

- \*+82 DEB-KIRTANIYA (S), GHOSH (MR), ADITYACHAUDHURY (N) and CHATTERJEE (A). Extracts of garlic as possible source of insecticides. Indian J. Agric. Sci. 50(6); 1980; 507-509

An oil fraction and a crude methanolic extract of minced cloves of garlic (*Allium sativum* Linn.) were obtained after steam distillation and Soxhlet extraction resp. Both extracts showed larvicidal properties against larvae of *Spodoptera litura* Linn (third instar), *Euproctis* sp. (second and fourth instars) and mosquito larvae of *Culex* sp. Crude juice of garlic was also highly potent as a contact insecticide. MVG

Fruit vegetable

Tomato

- \*83 BALWINDER SINGH, DHALIWAL (GS) and KALRA (RL). Residues of quinalphos and phosalone in tomato. Bull. Environ. Contam. Toxicol. 24(3); 1980; 423-426

Quinalphos (0.03% aqueous emulsion prepared from Eklaux<sup>R</sup> 25 EC) and phosalone (0.06% aqueous emulsion prepared from zolone<sup>R</sup> 35EC) were sprayed on tomato crops at the rate of 0.250 and 0.437 kg a.i./ha resp. Quinalphos



spray resulted in the initial deposit of 1.8 ppm on tomato, which dissipated to the level of 1.2, 0.5 and 0.2 ppm in 1, 2 and 4 days resp. In case of Phosalone, the initial deposit of 1.7 ppm declined to 0.9, 0.7 and 0.4 ppm at the end of 1, 2 and 4 days resp. The effect of the type of container (glass beakers) of polyethylene bags) was not as significant with phosalone as with quinalphos. BSN

- 84 CANELLA (M) and CASTRIOTTA (G). Protein composition and solubility of tomato seed meal. Food Sci. + Technol. 13(1); 1980; 18-21

Solubility experiments on the unheated, control seed meal revealed that globulin was the major protein component, followed by albumin and glutelin. A meal concentration of 2% (w/v), a time of 30 min, and a temp. of 50°C represent the optimal conditions for the extraction of tomato seed protein. The minimum solubility was found to occur at pH 5.0. The high temperature employed by the canning industry for processing tomatoes remarkably affects protein extractability of tomato seed meal wastes. KMD

- 85 LEONI (C), BOLZONI (L), and ALDINI (R). Holding time of crushed tomatoes before finishing and concentration: Effect on the consistency of the concentrate produced. Ind. Conserv. 54(3); 1979; 199-203 (Italian)

It was observed that a holding time of 2-3 hours had a remarkably positive effect, similar to that obtainable by the "hot-break" technique. However, unlike what occurs in this case, the fraction of pectic substances to which the effect appears to be due, consists of pectinates, not of pectinic acids or protopectins. The amount of free galacturonic acid formed decreased with increasing holding time. It was not possible to determine whether this was due to a particular mechanism of reaction or to a partial inhibition of enzymic activity. AA

- 86 SILVESTRI (G), SIVIERO (P) and PELIZZARI (A). Investigations on tomato varieties for mechanical harvesting. Ind. Conserv. 54(2); 1979; 112-118 (Italian)

Twenty-three tomato varieties designated as "suitable for mechanical harvesting" by the main seed growers in this field were evaluated from the morphological and agronomical points of view. Marked similarities were found between lines having different names. The numerous varieties which proved suitable offer the possibility of a wide choice. AA

#### Chilli

- \*+87 DEB-KIRTANIYA (S), GHOSH (MR), MITRA (SR), ADITYACHAUDHURY (N) and CHATTERJEE (A). Note on insecticidal properties of the fruits of chilli. Indian J. Agric. Sci. 50(6); 1980; 510-512

Dried and powdered fruits of *Capsicum frutescens* Linn were extracted with petrol cum ether (b.p. 60-80°C) and the solvent conc. The thick extract was chromatographed over silica gel and chromatogram was eluted with solvents of increasing polarity. The fractions collected from eluates were oily in consistency and were therefore defatted and finally extracted with methanol. These fractions when tested against rice weevil (*Sitophilus oryzae* Linn) showed insecticidal properties. MVG

#### Bread fruit

- 88 QUIJANO (J) and ARANGO (GJ). The breadfruit from Colombia: A detailed chemical analysis. Econ. Bot. 33(2); 1979; 199-202

A detailed analysis of the bread fruit seed including chemical, seed oil, seed protein and amino acid content. KAR



Cucurbit

Gourd

- 89 ITOH (T), TAMURA (T), JEONG (TM), TAMURA (T) and MATSUMOTO (T). 10°C -  
Cucurbita-5, 24-dien-3 $\beta$ /ol from gourd seed oil. Lipids. 15(2); 1980;  
122-123

## FRUITS

Berry

Grape

- 90 FREEMAN (BM), LEE (TH), and TURKINGTON (CR). Interaction of irrigation  
and pruning level on grape and wine quality of Shiraz vines. Am. J.  
Enol. Vitic. 31(2); 1980; 124-135

Irrigation combined with severe pruning (160 nodes) hastened sugar accumulation in one year, while in the other three years severe pruning only led to delayed ripening. Non-irrigated vines reached critical stress level much earlier than the irrigated vines, but accumulated berry sugars rapidly than irrigated vines. Acidity content and pH of juice differed between the irrigated and non-irrigated berries. However, acidity of juice of berries in non-irrigated vines decreased, while berries from irrigated vines increased during fermentation. BSN

- 91 ROBERTSON (GL), ESCOFFIER (R) and CRESSWELL (KJ). Seasonal changes  
in the pectic substances of grapes and their implication in juice  
extraction. Am. J. Enol. Vitic. 31(2); 1980; 162-164

During ripening and at harvest three pectin fractions (water soluble, oxalate soluble, and hydroxide soluble) were measured in three New Zealand grown grape varieties. The pectin content decreased during ripening. When water soluble fraction exceeds 10 mg anhydrogalacturonic acid per 100 g of grapes, they form a glutinous mass on crushing. As a result, it becomes difficult to extract juice. BSN

- 92 SIDAHMED (OA) and KIEWER (WM). Effect of defoliation, gibberellic acid  
and 4-chlorophenoxyacetic acid on growth and composition of Thompson  
seedless grape berries. Am. J. Enol. Vitic. 31(2); 1980; 149-153

Banana

- 93 BOWREY (RG), BUCKLE (KA), HAMEY (I) and PAVENAYOTIN (P). Use of solar  
energy for banana drying. Food Technol. Aust. 32(6); 1980; 290-291

This solar energy based drier is useful for drying banana, other tropical fruits, vine fruits, cereal grains and oilseeds. Schematic diagram of the drier is given and banana takes 72 hr to dry to the required moisture. KAR

Strawberry

- 94 KENNY (TA). Studies on precooling of soft fruit. 1. Strawberries. Ir.  
J. Food Sci. Technol. 3(1); 1979; 19-31

Storage life was considerably reduced when strawberries were precooled for 8 hr as against 3 hr of precooling after picking. Strawberries (var. (i) Cambridge Vigour (ii), Red Gauntlet and (iii) Cambridge Favourite showed storage losses ranging from  $\leq 7\%$  and weight loss of  $\leq 10\%$ . (i), (ii) and (iii) may be stored for 2 days at 2° + 1 day at 20-22°C, for 4 days at 2-5° day at 20-22°C and for 6 days at 2-5° + 1 day at 20-22°C resp. Significant changes were not observed in colour, firmness, ascorbic acid, soluble solids and acidity in the fruits during storage.



In (iii) flavour did not deteriorate when stored for 6 days at 2° + 2 days at 20-22°, whereas (1) showed less stability in this respect. BSN

- 95 WILKES (PS). Detection of Bis-(Trichloromethyl) disulfide in strawberries. Bull. Environ. Contam. Toxicol. 23(6); 1979; 820-824

### Citrus

- 96 ANON. Citrus fruits : a survey on production and marketing. Profodcil Bull. 14(4); 1980; 1-8

Various existing var. of citrus fruits and their climatic requirements and harvesting seasons are surveyed. World production and problems of production and marketing of citrus fruits are also reviewed. Suggestions regarding the handling and transport of the fruits are given and need for organisation of growers' cooperatives to promote increased exports is stressed. MVG

- 97 CARNEVALE (J). Determination of ascorbic, sorbic and benzoic acids in citrus juices by high-performance liquid chromatography. Food Technol. Aust. 32(6); 1980; 302-305

A method is described for the simultaneous estimation of ascorbic, sorbic and benzoic acids in citrus juices by high-performance liquid chromatography (HPLC) using a  $\mu$ Bondapak/CN column and 2% acetic acid/methanol (19:1) as mobile phase. Detection of ascorbic acid was at 254 nm and of sorbic and benzoic acids at 230 nm. For ascorbic acid good agreement was obtained between HPLC and 2, 6-dichlorophenolindophenol methods. Average recoveries of sorbic and benzoic acids added to orange and grapefruit juices were 102% and 99%, respectively. AA

### Grapefruit

- 98 SYVERTSEN (JP) and ALBRIGO (LG). Some effects of grapefruit tree canopy position on microclimate, water relations, fruit yield and juice quality. J. Am. Soc. Hortic. Sci. 105(3); 1980; 454-459

Greater fruit loads with higher °Brix and lower acidity in the outside canopy position was observed than in the inside positions. Upper canopy positions tended to have lower acidity and consequently higher °Brix/acid ratios than the lower positions. Abaxial fruit hemispheres were smaller and had lower per cent juice than their paired adaxial fruit hemisphere. Grapefruit from sunlit canopy positions mature earlier than fruit from shaded positions. Daily heat stress and leaf and fruit water stress were not limiting factors in grapefruit yield and juice quality with respect to different tree canopy positions. KAR

### Orange

- 99 GHERARDI (S), CARISANO (A), GERMANI (G) and BIGLIARDI (D). Amino acid content of Italian orange juice as affected by modern manufacturing processes. Ind. Conserv. 54(4); 1979; 296-301 (Italian)

A study of the effect of modern manufacturing process on the main analytical characteristics of orange juices, with special reference to the amino acid content, was carried out directly in some citrus-processing factories. Thermal and mechanical treatments were found to cause only slight changes in the composition of natural juice. In addition, 1st extraction juices were compared with 2nd extraction ones. The most remarkable analytical differences were found in total acidity; however, a more reliable index for differentiating these juices can be drawn from the content and ratio of some minor amino acids (leucine, isoleucine, tyrosine and phenylalanine). AA



- \*+100 RICH SINGH and RANJIT SINGH. Effect of granulation on physical and chemical characters of the fruit of 'Kaula' mandarin. Indian J. agric. Sci. 50(7); 1980; 565-568

Granulated and non-granulated (healthy) fruits of *Citrus reticulata* Blanco were evaluated for loss of fruit quality due to granulation during November and December of 1976. In granulated fruits there were appreciable losses in density, dry matter, wt., juice, pulp, total soluble solids, acidity and ascorbic acid. They also had more moisture, peel and starch content than ungranulated fruits. The losses of total soluble solids were 6.04 and 8.25%, and of total acidity were 9.90 and 10.42% in November and December resp. They were also 11% lighter and had 22.40 and 31.25% more starch than healthy fruits in November and December resp. EWG

Bael fruit

- 101 ROY (SK) and SINGH (RN). Bael fruit (*Aegle marmelos*) - A potential fruit for processing. Econ. Bot. 33(2); 1979; 203-212

Aspects covered include chemistry and medicinal properties; botany and morphology, cultivars; propagation; harvesting, packing and storage; and processing. KAR

Pome

Apple

- 102 KORMENDY (I). Experiments for the determination of the specific resistance of comminuted and pressed apple against its own juice. Acta Aliment. 8(4); 1979; 321-342
- 103 WATADA (AE), ABBOTT (JA) and HARDENBURG (RE). Sensory characteristics of apple fruit. J. Am. Soc. Hortic. Sci. 105(3); 1980; 371-375

A profile was developed to describe sensory characteristics of 'Golden Delicious', 'Miller Spur', 'Redspur', 'Rome Beauty', and 'York Imperial' apples (*Malus domestica* Borkh.). Ten sensory attributes were selected and the intensities of the attributes were plotted on a circular graph. The patterns of the plots differed among cultivars and patterns of some cultivars changed with successive harvests and storage of apples. The patterns were used to describe the general sensory characteristics of apples. AA

## SUGAR, STARCH AND CONFECTIONERY

Sugar

- 104 MOSKOWITZ (HR). Psychological correlates of sugar consumption. J. Food Qual. 2(1); 1978; 27-40

Reviews some of the research on the sweet taste which has been published during the past several decades. It stresses the division of our understanding of sweetness into three sections: quality (type of taste, and the role of sweetness), measurement of sweetness intensity or strength of the perception and the correlation with physical measurements, and finally the hedonics of sweetness which represents the affective portion. Data is presented from a real-world study on the sweetness and liking of a beverage which illustrates that although children and adults may perceive the sensory characteristics of sweetness in similar manners, nonetheless their hedonic reactions are quite different to the same sweetened beverage. AA



## Starch

- 105 VAN BEYNUM (GMA), ROELS (JA) and VAN TILBURG (R). Equilibrium relationships in the degradation of starch by an amyloglucosidase. *Biotechnol. Bioeng.* 22(3); 1980; 643-649

## BAKERY PRODUCTS

## Bread

- 106 LORENZ (K), JANSEN (GR) and HARPER (J). Nutrient stability of full-fat soyflour and corn-soy blends produced by low-cost extrusion. *Cereal Food. World.* 25(4); 1980; 161-172

Full-fat soy flour (FFSF) and corn-soy blends were extruded with the Brady and Insta-Pro extruders. Antitrypsin activity in FFSF decreased with increasing extrusion temperature and with addition of small quantities of water during extrusion. Urease activity was more easily destroyed than antitrypsin activity and was a less adequate indicator of the effectiveness of heat treatment of soybeans. Extrusion at 143°C produced the highest FFSF protein efficiency ratio (1.94), compared with 2.5 for casein. In fortified whole corn/whole soy blends, vitamin retentions (measured immediately after extrusion) were greater than 90%, except for vitamin C, of which about 80% was retained. In extruded blends of fortified degermed corn and dehulled soy, more than 90% of all vitamins were retained. Vitamin C was almost totally lost when stored at 49°C and 60% RH, but more than 70% of other vitamins were retained in extruded products stored under various conditions for one month. Breads of satisfactory quality were produced with extruded FFSF. AA

## Biscuit

- 107 GARELLO (C). Use of E-alpha-tocopherol in vitaminized and dietetic biscuit production. *Ind. Aliment.* 18(167); 1979; 880-884 (Italian)

The author has discussed the quantities of vitamins that should be present in biscuits in order that they may be correctly designated as "dietetic" biscuits. He then discusses the use of vit. E and its effects on (a) reproduction and libido, (b) the skin, (c) aging, (d) the heart and lungs, and also certain medical controversies connected therewith. KMD

- 108 SCARPELLINI (P), DEGLI ANGELI (A) and CIRILLI (G). L-cysteine, a technological additive in the production of biscuits (preliminary study). *Ind. Aliment.* 18(166); 1979; 789-793 (Italian)

Addition of 0.1-10 ppm of l-cysteine to the national standard, bread flours of Italy permits a better working up of the dough and saves time. Doses greater than 10 ppm are optimal for biscuit flours; but the same result can be obtained also with bisulphite (not permitted at present) or with enzymes which are not easy to dose out. KMD

## MILK AND DAIRY PRODUCTS

- \*+109 BHADANIA (AG) and SHAH (US). Saving of steam in dairy plants. *Indian Dairyman.* 32(9); 1980; 711-713

Losses of heat through various ways in dairy processing plant and the possible methods to overcome such heat losses have been outlined. MVG



- \*+110 KOHLI (RK), RAWAL (SR) and ANEJA (VP). Measurement of texture of dairy products. Indian Dairyman. 32(8); 1980; 623-625

Measurement of various textural parameters like rheology, hardness, cohesiveness, viscosity, elasticity and the instruments available for measurement have been considered. MVG

- 111 POMPEI (C). Pollution control in the dairy industry. Ind. Aliment. 18(165); 1979; 720-734

- 112 WONG (NP) and LaCROIX (DE). Biological availability of calcium in dairy products. Nutr. Rep. Int. 21(5); 1980; 673-680

The preliminary experiments indicate that calcium availability in dairy products is affected by the nature of the calcium complex and products that contain colloidal calcium phosphate or calcium caseinate are better calcium sources than those that contain only ionic calcium. KAR

#### Milk

- \*+113 AGRAWALA (SP), BIKRAM KUMAR and ANAP (GR). Village level in-can chilling. Indian Dairyman. 32(8); 1980; 627-629

The suitability of different types of coolers for village level chilling of milk has been reviewed. An in-can milk cooling unit has been proposed which consists of a refrigeration system and an insulated box to store the cans. Details of the unit are diagrammatically represented and economic factors are briefly mentioned. MVG

- \*+114 ANEJA (RP). A comprehensive approach to milk marketing and the role of long-life milk. Indian Dairyman. 32(9); 1980; 647-653

The milk marketing system currently existing in India including pasteurization, containers, and the advantages of long-life milk have been covered. MVG

- 115 BARRY (JG) and DONNELLY (WJ). Casein compositional studies. I. The composition of casein from Friesian herd milks. J. Dairy Res. 47(1); 1980; 71-82

- 116 CHOPIN (M). Resistance of 17 mesophilic lactic Streptococcus bacteriophages to pasteurization and spray-drying. J. Dairy Res. 47(1); 1980; 131-139

For 17 phages active against streptococcus cremoris, Str. lactis and Str. lactis sub. sp. diacetylactis, the killing efficiency of pasteurization ( $\log N_0/N$ ) at 72°C for 15 sec in skim milk showed large variations from  $>6.0$  to 0; the efficiency of killing during spray drying ranged from 3.7 to 0.2 and phages survived well storage of milk powder at room temperature. Destruction in a heat exchanger was found to be greater than that calculated from biphasic curves obtained by heating phages in sealed ampoules. No relationship was established between lytic classification of phages and their heat resistance. AA

- 117 DEVRIESE (LA) and DE KEYSER (HD). Prevalence of different species of coagulase-negative staphylococci on teats and in milk samples from dairy cows. J. Dairy Res. 47(1); 1980; 155-158

- 118 GARNOT (P) and CORRE (C). Influence of milk protein concentration on the gelling activity of chymosin and bovine pepsin. J. Dairy Res. 47(1); 1980; 103-111

- 119 KOOPS (J) and WESTERBEEK (D). Simple flame photometric method for the calibration of loops in use for the enumeration of bacteria in milk. Neth. Milk. Dairy J. 33(4); 1979; 193-201

Loops are used for the determination of the total bacterial count in



refrigerated milk obtained from suppliers. The quantity of milk delivered by a loop can be estimated by measuring the lithiums-previously added to the milk as lithium chloride-that is present in the milk sample. A minute quantity of milk (approx. 137  $\mu$ l) is added to a known volume of Ringer's solution, and the concentration of lithium in the latter is measured by flame photometry. Thus, it calibrates the loops used for the sampling of farm milk and accelerates the cumbersome plate count procedure. KMD

- 120 LANGEVELD (LPM) and BOLLE (AC). Duration of the pre-incubation period in the sterility control of UHT-sterilized milk. Neth. Milk Dairy J. 33(4); 1979; 172-180

- 121 OHNO (S). Simple and rapid determination of iodine in milk by radio-activation analysis. Analyst. 105(1248); 1980; 246-250

Employing a van de Graff accelerator for the radioactivation analysis technique, iodine has been determined in milk samples. The technique is based on the separation of iodine from the irradiated sample by an iodine loaded resin. The detection limits of the present methods is even upto trace level (as against 10 and 5  $\mu$ g resp. for the gamma ray spectrometry and beta counting) with the precision  $\pm 5\%$  when iodine content exceeds 0.01 ppm. BSN

- 122 PETTIPHER (GL), MANSELL (R), MCKINNON (CH) and COUSINS (CM). Rapid membrane filtration-epifluorescent microscopy technique for direct enumeration of bacteria in raw milk. Appl. Environ. Microbiol. 39(2); 1980; 423-429

The membrane filtration epifluorescent microscopy technique used for direct enumeration of bacteria in raw milk is rapid, takes less than 25 min and is inexpensive, costing less than 50 cents per sample. The technique is suitable for milk with  $5 \times 10^3$  to  $5 \times 10^8$  bacteria per ml. BSN

- \*+123 RAVAL (NP) and BHATT (BC). Mehsana tackles milk sourage. Indian Dairyman. 32(8); 1980; 605-613

Dudhsagar Dairy at Mehsana, Gujarat, faces the problems of handling sour milk due to its geographic location and extreme climatic conditions and a poor road system renders quick transportation of milk from collection centre, difficult. Various methods to reduce sour milk percentage like chilling did not yield good results because of irregular supply of power, maintenance of equipment, etc. The traditional method of wrapping the gunny bags around the cans and wetting them regularly was more feasible as it presented no technical problems and could reduce the temp. by about 5 or 6°C and thus result in the fall of sour milk percentage. MVG

- \*+124 REDDY (YVR), VENKATARAMAN (TG) and SAMPATH (SR). Note on the cost of milk production of dairy animals in and around Bangalore city. Indian J. Anim. Sci. 50(1); 1980; 74-76

After taking into consideration various aspects involved, the cost of milk production per kg has been worked out as 6.43, 2.82 and 4.20 Rs for cross bred cows, non descript cows and buffaloes resp. BSN

- 125 RICHARDSON (T), McGANN (TCA) and KEARNEY (RD). Levels and location of adenosine 5'-triphosphate in bovine milk. J. Dairy Res. 47(1); 1980; 91-96

- \*+126 SHARMA (RK). Effect of heat treatment on the nutritive value of milk. Indian Dairyman. 32(8); 1980; 619-621

The effects of pasteurisation and sterilization of liquid milk on the different components of milk like lactose, fat soluble vitamins, water soluble vitamins and proteins have been covered. MVG



- 127 KADAS (L), PHAM VAN MINH and LINDNER (K). Characterization of cow's milk and buffalo milk by polyacrylamide gel electrophoresis. *Acta Aliment.* 8(2); 1979; 169-179

Buffalo milk contains more proteins than cow's milk, and it also possesses a rapidly migrating casein fraction that cannot be detected in cow's milk. Buffalo milk is also richer in whey proteins than cow's milk, and there is a difference in the relative proportions of different fractions. These differences make it possible to distinguish between the two kinds of milk, and their various mixtures.

The effects of different heat treatments (at 85 and 120°C) on these proteins has also been studied. Whey proteins decrease, as a result of heat treatment, while casein proteins tend to increase in proportion to the fall in whey proteins. Presumably, heat treatment leads to the formation of a complex between casein and whey proteins, and some fractions are formed which migrate with the casein proteins. KMD

- 128 Van der HAVE (AJ), DEEN (JR) and MULDER (H). The composition of cow's milk. 3. The calculation of the total solids content studied with separate milkings of individual cows. *Neth. Milk Dairy J.* 33(4); 1979; 159-163
- 129 Van der HAVE (AJ), DEEN (JR) and MULDER (H). The composition of cow's milk. 4. The calculation of the titratable acidity studied with separate milkings of individual cows. *Neth. Milk Dairy J.* 33(4); 1979; 164-171

## Buffalo milk

- \*+130 ASHOK KUMAR and MISRA (UK). Note on major lipids of buffalo milk. *Indian J. Anim. Sci.* 50(3); 1980; 273-275

- \*+131 DES RAJ and TANDON (KC). Effect of sterilization on different forms of phosphorous in buffalo milk. *Indian J. Dairy Sci.* 32(4); 1979; 442-445

Sterilization at 116°C for 15 min decreased the soluble and total inorganic phosphorous significantly in both cow and buffalo milk. Reduction in organic phosphorous was significant only in cow milk. Reductions in total and organic phosphorus of cow milk were significantly more than those in buffalo milk but no significant difference in the reduction of inorganic phosphorus was found between the milks of two species. KAR

## Goat milk

- \*+132 JAILKHANI (UK) and DE (S). Utilization of goat milk for Khoa making. *Indian J. Dairy Sci.* 32(4); 1979; 428-433

A suitable method has been developed for utilizing goat milk for khoa preparation. Khoa has been prepared by admixing buffalo milk, with different levels of fat and by homogenizing milk. The chemical composition of khoa is given. Khoa showed a shelf-life of 6-8 days at  $37 \pm 1^\circ\text{C}$  and 30 days at  $5 \pm 1^\circ\text{C}$ . KAR

## Buttermilk

- \*+133 ARORA (KL) and MATHUR (BN). Utilisation of butter milk as human food. *Indian Dairyman.* 32(9); 1980; 707-709

Butter milk (fluid obtained on churning of cream into butter) is a good source of protein, carbohydrates and minerals. Various food uses of butter milk such as, use as a beverage, for production of dairy products such as curd, cheese and ice cream, use in bakery products and for utilisation of its milk solids for standardization of milk are discussed. KAR



- 134 ABOU-DONIA (S), EL-SODA (M) and MASHALY (R). Enrichment of zabadi with soy extract. J. Dairy Res. 47(1); 1980; 151-153

Zabadi (a national type of yoghurt manufactured in Egypt) is prepared either by cow or buffalo milk. The body and texture of zabadi from the cow's or buffalo with soy extract mixture (10%) was the same as that of control samples while the flavour was found inferior to control samples (without soy extract). BSN

## Butter

- \*+135 BHANUMURTHI (JL) and DESAI (HN). Utilization of substandard (oxidised) butter oil in the manufacture of dried ice cream mixers. Indian J. Dairy Sci. 32(4); 1979; 434-441

Attempts were made to utilize substandard butter oil with a peroxide value of 0.25 m.e. of O<sub>2</sub> per kg of fat and perceptible oxidized flavour by preparing ice cream either by mixing with 50% fresh cream or with butter oil alone. The products were compared with ice cream made from cream alone. The products was packed-under nitrogen in polyethylene bags and was stored for 60 days at room temperature (8-30°C) and at 37 ± 1°C. The dried ice cream mix made from butter oil as the only source of fat had a slightly oxidised flavour and high TBA values and was unacceptable. The product made from 50% butter oil and 50% cream was found to have acceptable flavour even after 60 days of storage. KAR

- \*+136 DARSHAN LAL and NARAYANAN (KM). Note on the stability of butylated hydroxy anisole in butter during conversion into ghee and subsequent storage. Indian J. Anim. Sci. 50(1); 1980; 82-83

Stability of BAA is influenced by the temperature of conversion of butter into ghee and its subsequent period of storage. BSN

- 137 GARGANO (A). Control of butter imported from EEC. Ind. Aliment. 18(163); 1979; 557-558 (Italian)

## Whey

- 138 MADRID VICENTE (A). Lactose production from dairy whey. Ind. Aliment. 18(166); 1979; 811-816 (Italian)

## Cheese

- 139 BARS (JL). Cyclopiazonic acid production by penicillium camemberti thom and natural occurrence of this mycotoxin in cheese. Appl. Environ. Microbiol. 38(6); 1979; 1052-1055

Mycotoxin appeared on the crust. (0.05 to 0.1 µg/g) in three samples, 0.1-0.2 µg/g in five samples and 0.4, 1.0 and 1.5 µg/g in three different samples. However, mycotoxin was not present in the inner portions of the crust. Doses eventually digested by consumers are very low (lower than 4 µg) as against very heavy doses required for for causing toxicity hazards. BSN

- 140 BURGESS (KJ) and KELLY (J). Alcohol production by yeast in concentrated ultrafiltration permeate from cheddar cheese whey. Ir. J. Food Sci. Technol. 3(1); 1979; 1-9

- 141 REYROLLE (J) and LETELLIER (F). Localization of active microorganisms in cheese by autoradiography. Appl. Environ Microbiol. 38(6); 1979; 1162-1165



## Milk powder

- \*+142 GANDHI (DN) and ANIL KUMAR (PA). Spray-dried acidophilus milk powder. Indian Dairyman. 32(8); 1980; 599-600

Effect of spray drying on the viability of *Lactobacillus acidophilus* and the antibacterial activity of acidophilus sour milk was investigated. Acidophilus milk was prepared by standard method and supplemented with skim milk, gelatin and lactose to increase the TS to 24% and spray dried after homogenisation. During drying, the inlet and outlet temp. were maintained at 18°C and 90°C resp., and the speed of automiser was fixed between 20,000 and 24,000 rev/min. No changes in antibacterial activity were observed in reconstituted dried product. Though the number of *L. acidophilus* cells in dried acidophilus milk was comparatively less ( $9.04 \times 10^5$  /g), they fermented milk within 12 h at 40°C when 1-3% of the powder was used as inoculum. The dried product stored at 30°C and 40°C showed antagonistic action against *Escherichia coli*, *Bacillus cereus* and *Micrococcus flavus* even after 3 months though no viable bacteria were observed. This may be due to the production of antagonistic substances during fermentation which are resistant to heat of spray drying. Storage at refrigerator temp., however, showed presence of viable cells and antibacterial activity even after 3 months. MVG

## MEAT AND POULTRY

## Meat

- 143 BAIRD-PARKER (AC). The role of industry in the microbiological safety of foods. Food Technol. Aust. 32(5); 1980; 254-260

A very descriptive review covering microbiological safety in meat and meat products, poultry, plant products, sea and fresh water foods. Precautions needed in harvesting and storage, food processing, distribution and handling. KAR

- 144 CASERIO (G), STECCHINI (M), PASTORE (M) and GENNARI (M). Action of nisin and nitrite, separately and together, on the germination of *Clostridium perfringens* spores in meat mixtures (pastes) subjected to stewing. Ind. Aliment. 18(167); 1979; 894-897, 900 (Italian)

Vegetative forms of *Clostridium perfringens* were found in samples of sausages to which nisin had not been added. Nitrite alone, at the levels of 75 ppm or 150 ppm, could not impede germination of the spores. But a combination of nisin (20 g/q) and nitrite (75 and 150 ppm) could arrest germination of the spores, and even devitalized the spores themselves. After 28 days storage at 2-4°C, the residue of nisin was 43% of the quantity added initially. KMD

- 145 CATTANEO (P) and CANTONI (C). Effect of exposure of meat to chlorinated water. Ind. Aliment. 18(163); 1979; 529-532, 547 (Italian)
- 146 CHOI (KK) and FUNG (KW). Determination of nitrate and nitrite in meat products by using a nitrate ion-selective electrode. Analyst. 105(1248); 1980; 241-245

The direct potentiometric method employing a nitrate ion-selective electrode for determination of nitrate and nitrite in meat involves extraction of soluble nitrite and nitrate in meat by soxhlet extraction using boraxbuffer solution (pH<sub>9</sub>). The results obtained were compared with those obtained by recommended spectrophotometric methods. BSN

- 147 CIPRIANI (I). Rapid determination of protein content in meat and meat products. Ind. Aliment. 18(163); 1979; 543-547 (Italian)



- 148 CUZZONI (MI) and GAZZANI (G). Recent knowledge on the freezing of edible meat. *Ind. Aliment.* 18(163); 1979; 525-528 (Italian)

- 149 GABOR (E). Determination of the protein content of certain meat products by ultraviolet absorption spectrophotometry. *Acta Aliment.* 8(2); 1979; 157-167

A sample of the meat product is appropriately minced and homogenized and a suspension is prepared with NaOH; an aliquot part of the suspension is then treated with a mixture of acetic acid and chloroform. This treatment solubilizes the protein and fat contained in the product. The treated material is then filtered, and the solute is studied by photometry. Percentual protein content may be determined by measuring the optical density. The technique is comparable in accuracy to Kjeldahl's method; but it is also much quicker and suitable for on-line control, ready-product control, and serial testing alike. KMD

- 150 GILL (CO) and TAN (KH). Effect of carbon dioxide on growth of meat spoilage bacteria. *Appl. Environ. Microbiol.* 39(2); 1980; 317-319

Carbon dioxide did not affect spoilage bacteria, *Enterobacter* and *Microbacterium thermosphactum*, while respiration and growth in the other meat spoilage bacteria species was inhibited. Inhibition pattern in a complex medium was similar in case of four spp (fluorescent and non fluorescent *Pseudomonas*, *Alteromonas*, *putrifaciens* and *Yersinia enterocolitica*) with inhibition being complete, which reached a maximum level at a low level of CO<sub>2</sub> concentration. In case of *Acinetobacter*, inhibition continued to increase with increasing CO<sub>2</sub> concentration. Except in case of the nonfluorescent *pseudomonas* spp, degree of inhibition with a constant concentration of CO<sub>2</sub> in solution increased with decreasing temp for all CO<sub>2</sub> susceptible spp. BSN

- 151 RENON (P), ROTTONDI (P) and CANTONI (C). Nickel in foods of animal origin. *Ind. Aliment.* 18(166); 1979; 819-821 (Italian)

The content of nickel in meats, fishes, clams, eggs, salami, milk, yoghurts and other dairy products have been determined and are reported. The values range from 0.04 to 1.086 ppm. KMD

- 152 UBERTALLE (A) and MAZZOCCO (P). Comparison between three measurement methods of water-binding capacity in meat. *Ind. Aliment.* 18(163); 1979; 533-540 (Italian)

The comparison of three measurement methods of water-binding in meat showed a correlation between the press method and the centrifugation method, and lack of correlation of these two methods with the ultracentrifugation one. Furthermore the measurement of the relationship of added salt on the water-binding have been masked by the two former methods. AA

#### Cattle (Beef)

- 153 CHIRIFE (J), VIGO (MS), SCORZA (OC), BERTONI (MH) and CATTANEO (P). Retention of available lysine after long term storage of intermediate moisture beef formulated with various humectants. *Food Sci. + Technol.* 13(1); 1980; 44-45

Samples of intermediate moisture beef (a<sub>w</sub> 0.83) prepared by "moist infusion" in different combinations of NaCl, glycerol, and sucrose were stored for 14 months at 34°C. A very high retention of available lysine was found in all the samples, even in those containing sucrose as the a<sub>w</sub>-lowering agent. This behaviour is attributed to leaching, during infusion, of reducing sugars naturally occurring in meat, and to the lack of a significant degree of sucrose hydrolysis during storage. KMD

- 154 SHERIDAN (JJ) and LYNCH (B). Effect of microbial contamination on the storage of beef carcasses in an Irish meat factory. *Ir. J. Food Sci. Technol.* 3(1); 1979; 43-52



Removal of diaphragm did not have any impact on storage life of chill stored beef carcasses for 17 days. contamination by microbes was very heavy in the rib cage area as compared to the neck. BSN

- 155 ZABIK (ME) and ZABIK (MJ). Dioxin levels in raw and cooked liver, loin steaks, round, and patties from beef fed technical grade pentachlorophenol. Bull. Environ. Contam. Toxicol. 24(3); 1980; 344-349

The study has not conclusively established that technical grade pentachlorophenol exposure of growing cattle results in formation of significant levels of dioxin in different muscle cuts which could prove a hazard to humans consuming such meat. However, the livers of such cattle showed higher accumulation of different isomers clearly pointing to the need for keeping away cattle from pentachlorophenol treated wood. BSN

#### Sheep

- 156 CATTANEO (P), BIANCHI (MA), BERETTA (G) and CANTONI (C). Conservability of lamb's meat and its nutritive value. Ind. Aliment. 18(164); 1979; 641-643 (Italian)

Lamb's meat spoils more easily than beef or veal and can normally be stored (at +4°C) for not more than 4 days. A storage life of 1-2 weeks can be attained by keeping it uninterruptedly at -1 to 0°C in a cold chain. The chemical composition-including fatty acid and amino acid compositions-has been reported in detail, and compared to that of veal. Variations of the TVN and of the hypoxanthine index of lamb's meat stored at +4°C have been reported. KMD

#### Pig (Pork)

- 157 WINSTANLEY (M). Pre-slaughter stress in pigs. Food Technol. NZ 15(5); 1980; 37-39

The reasons for the preslaughter stress in pigs and the research made in the UK in this direction have been reviewed. KAR

- 158 HINES (RC), RAMSEY (CB) and HOES (TL). Effects of microwave cooking rate of palatability of pork loin chops. J. Anim. Sci. 50(3); 1980; 446-451

Overall acceptability of 1.9 cm thick pork chops cooked at high microwave setting (505 power watts) was lowest as compared to low (205 power watts), medium (270 power watts), roast (350 power watts) cooking. As such low microwave setting and broiling gave more desirable and satisfactory products. BSN

#### Poultry

##### Chicken

- 159 DEMBY (JH) and CUNNINGHAM (FE). Factors affecting composition of chicken meat. A literature review. World. Poult. Sci. J. 36(1); 1980; 25-67

Review covers: nutritional value of chicken, changes in nutritional value during commercial processing (initial composition, stunning, scalding, plucking, chilling, postmortem aging, freeze drying, curing and smoking, canning), and nutrition changes after processing. (losses during storage, thawing and draining; cooking and stewing). BSN

- 160 ORANFI (M) and CERLETTI (P). Chemical composition and nutritional value in vitro of mechanically-deboned poultry meat. Brit. Poult. Sci. 21(1); 1980; 1-7

Data on proximate analysis, amino acid make up and digestibility of proteolytic enzymes of pastes from mechanically deboned chicken breasts. Neck, wings and backs and hand-deboned breasts have been reported and discussed. The nutritive value of the pastes as human food compared



very favourably with other protein foods. Nutritional value was not altered by mechanical deboning. Protein quality and digestibility of breasts were slightly better than those for other poultry parts. BSN

- 161 LECLERCQ (B), BLUM (FC) and BOYER (JP). Selecting broilers for low or high abdominal fat: initial observations. Br. Poult. Sci. 21(2); 1980; 107-113
- 162 NOTERMANS (S), TERBIJHE (RJ) and VAN SCHOTHORST (M). Removing faecal contamination of broilers by spray-cleaning during evisceration. Br. Poult. Sci. 21(2); 1980; 115-121

Broiler carcasses contaminated with fecal matter during evisceration showed an increase in contamination with Enterobacteria, including salmonellas present. Spray cleaning during various stages of evisceration prevents completely such contamination by faecal organisms. Cleaning of carcasses only at the end of the evisceration treatment does not lead to reduction of Enterobacteriaceae to initial levels. However, salmonella may be eliminated much earlier and easier than Enterobacteriaceae. BSN

#### Duck

- \*\*+163 PANDA (PC) and RAO (DN). Quality of duck eggs marketed in Mysore city. Indian Poult. Gaz. 64(1); 1980; 7-11

Duck eggs marketed in Mysore were generally of a poorer quality during July, August and September than during October and December. Nest clean eggs constituted only 17.1% of the total, while dirty one's accounted for nearly 40.1%. The microbiological quality of the eggs was also seen to be poor. Some of the E.coli strains isolated belonged to serogroups which cause public health problems. KMD

#### Turkey

- 164 ADAMS (BW), MEAD (GC) and PENNINGTON (DE). A scrape-sampling device for the microbiological examination of poultry carcasses. Br. Poult. Sci. 21(1); 1980; 71-75

The design and operation of a scrape-sampling device has been reported. This device was used for scrape sampling of turkey carcasses from five different stages in processing. The microbial counts with the scraper were slightly lower as compared to those obtained with the colworth Stomacerta with a large proportion of organisms present in the skin. The counts were significant ( $P < 0.05$ ) only at two stages of processing. BSN

#### Quail

- \*+165 SINGH (RP), SHRIVASTAV (AK) and PANDA (B). Studies on slaughter characteristics of Japanese quail (*Coturnix coturnix japonica*) at different stages of growth. Indian Poult. Gaz. 64(1); 1980; 12-17

16 quails of each sex were slaughtered and processed at the age of 5, 6, 7, and 8 wk. Sex had no effect on the live wt., nor the evisceration percentage in birds upto 6 wk age there after, females had a greater live wt., and higher evisceration percentage. Younger birds showed higher percentage of shrinkage due to starvation. Dressing percentage increased significantly upto 6 and 7 wk in females and males resp. Total offal was significantly greater in females than in males at 7 and 8 wk. Breast constituted the highest cut, followed by back, thighs, wings, drumsticks, and neck. KMD



## Egg

- 166 PAYNE (F) and GOOCH (JET). Survival of streptococci in raw and pasteurised egg products. Br. Poult. Sci. 21(1); 1980; 61-70

Pasteurisation of egg albumen resulted in a decrease in less than 10-fold of the viable cells of streptococcus faecalis and streptococcus faecium, while pasteurisation of whole eggs resulted in 100-fold decrease in only two of the eight strains studied. Strep. faecalis showed multiplication only in raw and pasteurised whole egg, but not in egg albumen. Strep. faecium multiplied in raw and pasteurized whole egg after an initial decline in viability which was not shown by cells adapted to whole egg. The number of viable cells was affected by the storage temp after a storage period of 5 days. Strep. faecium strains lost viability in raw and pasteurised egg albumen, which was maximum at 37°C. With decrease of storage temperature, more cells survived. BSN

- 167 SHERIDAN (AK). A new explanation for egg production heterosis in crosses between white leghorns and agustralorps. Br. Poult. Sci. 21(2); 1980; 85-88
- 168 TIECCO (G). Employment of Ovosan for egg-shell washing. Ind. Aliment. 18(166); 1979; 803-805 (Italian)
- 169 TSAI (LS), IJICHI (K), HUDSON (CA) and MEEHAN (JJ). A method for the quantitative estimation of cholesterol C-oxide in eggs. Lipids. 15(2); 1980; 124-128

## Sausage

- 170 PALMIA (F), PEZZANI (B) and RACZYNSKI (RG). Determination of water activity ( $a_w$ ) in raw sausages as a function of water and salt contents. Ind. Conserv. 54(4); 1979; 308-312 (Italian)

Water activity ( $a_w$ ) is a useful criterion for evaluating the keeping quality or the time-course of ripening of raw sausages; its measurement however, is a complex one and requires expensive and delicate instruments. In this study, the method for calculating  $a_w$ -values from easily obtainable analytical data such as salt and water contents was tested in typical Italian salami. From the results obtained it can be concluded that calculated  $a_w$ -values are very near and closely related to experimental ones. AA

- 171 PEDRIELLI (R), PIZZA (A) and MONTUSCHI (M). Use of non-meat animal and vegetable proteins in formulations of mortadella sausages. Ind. Conserv. 54(3); 1979; 204-208 (Italian)

The possibility of employing blood plasma, sodium caseinate, lactalbumin and soy protein isolate in partial substitution for meat proteins in mortadella sausages was studied. Four base formulations with four different lean meat to added water ratios were chosen; in all cases, free fat content was kept constant. In each one of the base formulations, increasing amounts (4, 8, 16 and 32%) of non-meat proteins were substituted for meat proteins. The various mixes were evaluated on the basis of weight losses, texture, colour, aroma and flavour. The results obtained show that flavour and aroma are the main limiting factors in the use of non-meat proteins; maximum acceptable substitution level was found to be 16% for soy protein isolate and higher for sodium caseinate. Lactalbumin and blood plasma give rise to off-flavours which make their incorporation in mixes for mortadella sausages highly questionable. AA

- 172 PIZZA (A), PEDRIELLI (R) and MONTUSCHI (M). Quality of Wiener-type sausages supplemented with milk proteins: Stability and organoleptic properties. Ind. Conserv. 54(4); 1979; 313-317 (Italian)

The possibility was examined of using some milk derivatives (NFDM, sodium caseinate, whey albumins, whey globulins) in wiener-type sausages as mere



protein supplements. To this end, 2% of these proteins was added to a base formulation containing 10% meat proteins and variable amounts of fat (from 20 to 30%). All non-meat proteins showed good binding capacity for either fat or water, according to whether the former or the latter prevailed in the formulation. In addition, no unfavourable effects on flavour, colour and consistency of the sausages were observed for any one non-meat protein. All samples prepared in the laboratory were found to be firmer than commercial products with much the same fat content, but a lower total protein content. AA

- 173 RENON (P) and D'AUBERT (S). Origin of salmonellae contamination in sausage production. Ind. Aliment. 18(166); 1979; 817-818, 821 (Italian)

The skin (scalp) and the tonsils are two important sources of salmonella contamination of sausage meat. The scorching and de-hairing operations destroy almost all the organisms on the skin; but the tonsils, which are not accessible to sanitary treatments, remain as important sources of infection. To avoid contamination, such portions should be processed at some different place. KMD

### SEAFOODS

- 174 CANTONI (C), RADAELLI (A) and PERSIANI (G). Fluorine in sea animals used for human consumption. Ind. Aliment. 18(166); 1979; 822-825 (Italian)

The analysis of fluoride contents was made in 200 samples of seafoods. Results are reported. AA

- 175 CANTONI (C), RENON (P) and VENANZI (M). Effect of meat quality and heat on TVN concentration in canned seafoods. Ind. Aliment. 18(167); 1979; 885-887 (Italian)

The concentration of total volatile nitrogen (TVN) or basic volatile nitrogen, is a good indicator of the quality of the fish meat used in canned sea foods. It also indicates the duration of heat treatment. KMD

#### Fish

- \*+176 CHHATBAR (SK) and VELANKAR (NK). Studies on aminotransferase enzymes in fish and shellfish. Fish. Technol. 17(1); 1980; 51-55

Distribution of aspartate aminotransferase (AAT) and alanine aminotransferase (ALAT) and the scope of apparent transaminations in several fish and shell fish were investigated. In all skeletal muscles, AAT was higher than ALAT. AAT was also higher in red muscle than in white muscle. 2-oxo glutaric acid was observed to have a wider scope as an amino group acceptor than pyruvic acid in the skeletal muscle of fish. It was concluded that various transamination reactions discussed were probably of significance in post mortem handling and preservation of fish. MVG

- 177 HUSS (HH) and LARSEN (A). Changes in the oxidation-reduction potential ( $E_h$ ) of smoked and salted fish during storage. Food Sci. + Technol. 13(1); 1980; 40-43

The  $E_h$  and associated microbiological and biochemical changes in hot-smoked herring, cold-smoked salted and unsalted cod, and dry-salted mackerel have been examined. The  $E_h$  of freshly smoked fish products was positive (+100 to +250 mV). During subsequent storage at 15-17°C, the  $E_h$  remained positive, if TMAO reducing bacteria were eliminated (hot-smoking as carried out in this experiment) and when post-processing contamination was prevented, or growth of spoilage bacteria inhibited by salting ( $\geq 6.0\%$  NaCl in aqueous phase). The  $E_h$  dropped to negative



values as a result of bacterial reduction of TMAD to TMA, a change which is associated with loss of organoleptic acceptability. The surrounding atmosphere did not influence the  $E_h$  of hot-smoked herring as TMAO-reducing organisms grew well also under anaerobic conditions. Thus, smoked and lightly salted fish spoil due to the action of the same "specific spoilage bacteria", as those responsible for the spoilage of raw fish. KMD

- 178 MATSUI (M), OHSHIMA (H) and KAWABATA (M). Increase in the nitrosamine content of several fish products upon broiling. Bull. Jpn. Soc. Sci. Fish. 46(5); 1980; 587-590

A total of 20 commercial fish and shellfish products consisting of 11 fish species were analysed before and after broiling on a city gas range for carcinogenic N-nitrosamines. The mean concentration of N-nitrodimethylamine (NDMA) in 15 uncooked fish products except in dried squids was found to be  $2.4 \mu\text{g/kg}$  and the maximum value was found to be  $9.4 \mu\text{g/kg}$ . On gas-broiling, these levels increased to  $6.4 \mu\text{g/kg}$  and the maximum value found was  $26.1 \mu\text{g/kg}$ . Covering fish products with aluminium foil or broiling them on an electric range was found to be effective in decreasing NDMA formation. KAR

- \*+179 NARAYANASWAMY (D), NARASIMHA RAO (CV) and GOVINDAN (TK). Penetration of sodium chloride during prolonged salting of fish. Fish. Technol. 17(1); 1980; 63-64

Salt absorption and moisture expulsion in (i) thread fin bream (*Syngnatis japonicus*), (ii) jew fish (*Sciaenids* sp) and (iii) lactarius (*Lactarius lactarus*) during prolonged salting were investigated. (i) was gutted and salted in the ratio (salt to fish) 1:3, 1:5 and 1:7 at  $28^\circ\text{C}$  for 4 days; (ii) was gutted and salted in the ratio (salt to fish) 1:3 for 5 days at  $10^\circ\text{C}$ ,  $28^\circ\text{C}$  and  $40^\circ\text{C}$ . (iii) was gutted and salted in the ratio (salt to fish) 1:3 at  $38^\circ\text{C}$ . It was found that greater the proportion of salt employed, the quicker is its absorption and shedding of moisture by the muscle. Temp. also exerted a definite influence on rates of salt penetration and moisture loss. These are max. at  $40^\circ\text{C}$  and min. at  $10^\circ\text{C}$ . MVG

- \*+180 NATARAJAN (R), ABRAHAM (M) and BALAKRISHNAN (G). *Vibrio parahaemolyticus* and the seafood industry. Fish. Technol. 17(1); 1980; 1-6

*Vibrio parahaemolyticus* is considered as the vehicle of food borne gastroenteritis in fish eating communities. The review covers its occurrence in seafoods, procedures for isolation and identification, generation time and inactivation profiles. Response of the organism to high and low temp. and the relative efficiencies of various antibacterial agents against the pathogen are outlined. The public health hazard posed by the pathogen and the guidelines for control are reviewed. MVG

- 181 PELLEGRINO (C), CORRADO (A) and CEVASCO (MP). Quality control and inspection for fishery products in respect of spoilage microorganisms and oxidative changes. Ind. Aliment. 18(163); 1979; 551-556 (Italian)

- \*+182 VARMA (PRG), VALSAN (AP) and PRABHU (PV). Transportation of fish: III. Biochemical changes in fish during transportation in insulated containers. Fish. Technol. 17(1); 1980; 41-42

Five lots of fish packed with ice (fish to ice ratio 1:1) in thermocole lined tea chests were transported in non insulated rail wagons from (i) Vervel to Bombay (24 h) and (ii) Vervel to Delhi (40 h). In all lots except eel and hilsa transported to Bombay, moisture increased with transportation time. Trimethyl amino N (TMA-N) and total volatile N (TVN) of fish increased in (i) and (ii) during transportation. Max. increase of TMA-N and TVN were observed in sea fish. MVG



## Sardine

- 183 SEKI (N), OOGANE (Y) and WATANABE (T). Changes in ATPase activities and other properties of sardine myofibrillar proteins during ice-storage. Bull. Jpn. Soc. Sci. Fish. 46(5); 1980; 607-615 (Japanese)

Myofibrillar EDTA (ethylenediamine tetraacetic acid)-ATPase activity lost about 70% after 1 day storage in ice.  $\text{Ca}^{2+}$  - and  $\text{Mg}^{2+}$  -ATPase activities decreased to 50-40% of their initial levels after 6 day-storage. While  $\text{Mg}^{2+}$  -ATPase activity in the presence of EGTA increased and then decreased. Sub unit composition of the myofibrillar proteins with exception of myosin showed little change during ice-storage, While some degradation of myosin heavy chain due to proteolysis was observed. A specific sarcoplasmic protein was insolubilized readily within 1 day-storage of muscle. KAR

## Carp

- 184 ITOH (Y), YOSHINAKA (R) and IKEDA (S). Changes to higher molecular weight of protein molecules during the gel formation of carp actomyosin by heating and participation of SH groups in these changes. Bull. Jpn. Soc. Sci. Fish. 46(5); 1980; 617-620 (Japanese)

It was found that the solubility of actomyosin decreased and the molecular weight of protein molecules increased during the gel formation. These changes were impaired to some extent by adding the SH reagents to actomyosin. KAR

- \*+185 JAYARAM (MG), SHETTY (HPC) and UDUPA (KS). Organoleptic evaluation of flesh of carps fed on different kinds of feeds. Mysore J. Agric. Sci. 14(3); 1980; 421-424

Flesh of three carps, Catla (Catla catla), rohu (Labeo rohita) and common carp (Cyprinus carpio) fed (i) natural fish organisms, (ii) a conventional feed of rice bran and groundnut cake (1:1), (iii) a dry pelletised feed containing silk worm pupae, and (iv) fish meal as sole protein source were investigated for their organoleptic quality. Feeding was done for 98 days. No significant differences were evident in overall organoleptic quality of raw and cooked flesh as well as taste of cooked flesh attributable to (i)-(iv). MVG

## Catfish

- \*+186 PERIGREEN (PA) and JOSEPH (J). Freezing and cold storage of cat fish fillets. Fish. Technol. 17(1); 1980; 31-34

Skinless fillets of catfish were washed and drained for about 15 min and frozen in contact plate freezer at  $-35$  to  $-40^{\circ}\text{C}$  and stored with or without packaging at  $-18^{\circ}\text{C}$  for 32 wk. Wt. loss during storage and percentage yield of thawed fillets were determined at regular intervals during storage. Fillets frozen as glazed (water) blocks and packed in polyethylene lined waxed cartons had the max. shelf life of 27 wk. MVG

## Cod

- 187 KOTODZIEJSKA (I) and SIKORSKI (ZE). Inorganic salts and extractability of fresh and frozen fish proteins. Int. J. Refrig. 3(3); 1980; 151-155

In minced cod meat stored for 24 hr at  $4^{\circ}\text{C}$  and pH 5.5-7.2 the protein extractability (PE) decreases with increasing acidity. This is also true with samples containing NaCl and KCl while in  $\text{MgCl}_2$  and  $\text{CaCl}_2$ , PE is very significantly lower and does not depend on acidity. NaCl, KCl,  $\text{MgCl}_2$ , and  $\text{CaCl}_2$  added to the wasted meat in concentrations corresponding to  $\mu$  0.15 decrease the PE after 2 weeks of frozen storage by about 7%, 20%, 16% and 43% respectively. At  $\mu > 0.25$ , KCl phosphates and KCl +  $\text{CaCl}_2$  have during 2 wk, a protective effect on PE. KAR



## Milk Fish

- \*+188 JOSEPH (J), PERIGREEN (PA), CHINNAMIA GEORGE and GOVINDAN (TK). Iced and frozen storage characteristics of cultured *Chanos chanos* (Forsskal). *Fish. Technol.* 17(1); 1980; 21-25

Storage life of freshly harvested milk fish in crushed ice was estimated by following biochemical, bacteriological and organoleptic changes. Whole fish were stored in an insulated box in crushed ice. Samples drawn at intervals of 0, 4, 7, 10, 14 and 18 days were analysed for moisture, total N (TN) non-protein N (NPN), peroxide value (PV), salt soluble N (SSN), standard plate count (SPC) and overall organoleptic quality. Samples thus drawn were also quick frozen, glazed, packed in polythene-sheets and stored at  $-18^{\circ}\text{C}$ , and analysed for moisture, NPN, SSN, PV and organoleptic quality. Results indicated that during ice storage moisture gradually increased from 71.69 to 73.64% in the course of 18 days, and TN gradually decreased from 3.726 to 3.418%. Fish were organoleptically in good condition for 4 days and in fair condition for 10 to 14 days, but afterwards the eating quality deteriorated gradually due to toughening of texture and loss of juiciness and characteristic flavour. During frozen storage, moisture decreased gradually while TN did not change significantly. NPN increased upto 11 wk storage with a drastic fall in the 20th wk which may be attributed to drip loss. SSN fell gradually with storage period due to denaturation of proteins. PV increased with storage period due to fat oxidation. Organoleptically, frozen storage life of fresh fish was better than fish stored in ice prior to freezing, the period of storage having a significant retarding effect on storage life. MVG

## Crustacea (Shell fish)

- 189 CATTANEO (P) and CANTONI (C). Residual bisulphite in canned crustacean meat. *Ind. Aliment.* 18(167); 1979; 887-889 (Italian)

Sulphate and sulphite, when added to raw or cooked crustacean meat, are reduced to sulphite and sulphide respectively. AA

## Prawn

- \*+190 NAMBIAR (VN). Bacteriology of spoilage of canned prawns. *Fish. Technol.* 17(1); 1980; 35-39

Pure cultures of bacteria isolated from bacteriologically defective canned prawns as well as processing factory environs were inoculated with sterile prawn meat, and the pattern of spoilage, namely, production of off odour, bulging of the cans and the disintegration of meat were studied under aerobic and anaerobic conditions. Most of the cultures produced same kind of spoilage but the extent of spoilage differed among the different types of bacteria. The major spoilers were the gram positive spore formers and the spoilage was more with mixed cultures. MVG

## Frog

- \*+191 LEKSHMY NAIR (A) and PRABHU (PV). Utilization of frog waste. *Fish. Technol.* 17(1); 1980; 27-30

Raw frog waste was cooked in steam at 0.7 kg/sq cm for 30 min, the stock water was drained off and the press cake dried in sun in a tunnel drier or in an air oven. The dried product was powdered into meal and analysed. The yield of meal varied from 18.6 to 21.5% of the fresh frog waste. Chemical analysis showed that frog waste meal conformed to the standards prescribed for fish meal and livestock feed. MVG



## PROTEIN FOODS

- 192 BURGESS (KJ) and DOWNEY (G). Effect of coagulation bath composition on the composition and texture of casein-carrageenan fibres. *Ir. J. Food Sci. Technol.* 3(2); 1979; 151-157
- 193 DOWNEY (G) and BURGESS (KJ). Edible protein fibres produced from casein and carrageenan: the effect of repeated freeze-thaw cycles on fibre texture. *Ir. J. Food Sci. Technol.* 3(1); 1979; 53-57
- 194 DOWNEY (G) and BURGESS (KJ). Modification of the aqueous solubility of edible fibres composed of casein and carrageenan. *Ir. J. Food Sci. Technol.* 3(1); 1979; 33-42
- \*195 GARG (SK), BATISH (VK) and NEELAKANTAN (S). Single cell protein as food and feed. *Indian Dairyman.* 32(8); 1980; 615-617

Use of substrate, culture condition, nutritive value and the disadvantages of single cell protein have been outlined. MVG

- 196 KAMEL (BS) and KRAMER (A). Effect of consuming food supplemented with single cell protein on urine and serum uric acid levels. *J. Food Qual.* 2(2); 1978; 113-121

Supplementation of pizzas and date bars with different protein concentrates was found to increase their protein content significantly, but the addition of a yeast protein concentrate (SCP) derived from petroleum via alcohol was found to increase the nucleic acid content of the fortified formulations linearly with the amount of added SCP. The consumption of a total of 30 g of SCP via the fortified food for 3 weeks increased levels of uric acid in serum an average of 8 mg/100 ml and in urine up to 1210 mg/24 h. Two weeks after termination of the yeast intake, both values dropped to near-normal levels. AA

- \*197 SIDHU (MS) and SANDHU (DK). Single-cell protein production by *Trichoderma longibrachiatum* on treated sugar-cane bagasse. *Biotechnol. Bioeng.* 22(3); 1980; 689-692

### FRUIT JUICES AND BEVERAGES (ALCOHOLIC AND NON-ALCOHOLIC)

- 198 BOULTON (R). The general relationship between potassium, sodium and pH in grape juice and wine. *Am. J. Enol. Vitic.* 31(2); 1980; 182-186

Data on general relationship between concentration of cations, potassium and sodium and acidity measures of wine and grape juices have shown that pH is expressed as a function of the titratable acidity, the potassium and sodium contents and the tartrate to malate ratio. Changes in organic acid contents, titratable acidity, and mineral uptake and pH during maturation of grapes have been presented through grapes. It is also possible now to estimate the tartrate to malate ratio, which is considered to be an important quality parameter for selection of a deacidification procedure in wine preparation. BSN

- 199 McCLOSKEY (LP). An improved enzymic assay for acetate in juice and wine. *Am. J. Enol. Vitic.* 31(2); 1980; 170-173

The new method involving novel assay trapping reaction enables faster assay times of 35 min by use of an additional enzyme, phosphotransacetylase. For red wine analysis, interference from phenolics may be avoided by use of another enzyme polyvinylpyrrolidone and gelatin. Data from the assay for grape juice and wine show that assay reaction is complete and this makes for a quantitative assay for acetate anion in wine and juice. Acetic acid recovery was 100%. BSN



## Fruit juice

- 200 BIGLIARDI (D), GHERARDI (S) and POLI (M). Determination of tartaric, malic and citric acids in fruit juices by high pressure liquid chromatography. *Indust. Conserv.* 54(3); 1979; 209-212 (Italian)

An analytical procedure for the determination of the major organic acids occurring in fruits and fruit products has been studied which involves purification of the sample by passage through a column of strong basic Dowex resin and subsequent separation of the acidic components by high-pressure liquid chromatography on a  $\mu$  Bondapack- $C_{18}$  column. The results of analyses carried out on orange, lemon, apple and grape juices before and after the addition of known amounts of tartaric, malic and citric acid have been evaluated and compared with those obtained for the same samples by the enzymic method. AA

## Beverage (Non-alcoholic)

## Cola

- 201 MOSKOWITZ (HR), WOLFE (K) and BECK (C). Sweetness and acceptance optimization in cola flavoured beverages using combinations of artificial sweetness : A psychophysical approach. *J. Food Qual.* 2(1); 1978; 17-26

This paper develops a quantitative model relating concentration of sweeteners, perceived sweetness, off taste, and overall acceptability for cola beverages sweetened with artificial sweeteners. The psychological rules of sensory perception that govern reactions to pure aqueous systems of sweeteners are shown to hold for complex beverages that are normally drunk. By means of sensory assessments of products, acceptance and rejection limits can be specified both in terms of consumer reactions, and in terms of ingredients, once a model is developed which interrelates these variables. AA

## Tea

- \*+202 GUPTA (MM) and DANI (HM). Microsomal degranulation by tea tannins. *Curr. Sci.* 49(20); 1980; 790-791

Isolated rat liver microsomes incubated with tea tannins (40  $\mu$ g/ml) in the presence of 1 mM NADPH and liver microsome from rats injected subcutaneously with tea tannins (160 mg/K b.w.) were studied for degranulation. Results show that tea tannins degranulated rat liver microsomes over 20% and degranulation is enhanced to about 40% in the presence of NADPH which is required for the conversion of carcinogens to electrophiles which attack the biological nucleophiles like nucleic acids and proteins. Presence of  $Ca^{+2}$  in the post-microsomal supernatant or if added from outside protect the microsomes against degranulatory attack of carcinogens. Thus both the above in vitro and in vivo studies demonstrate that tea tannins are potential carcinogens. MVG

## Cocoa

- 203 JACQUET (H), VINCENT (J), HAHN (J) and LOTODE (R). Artificial drying of cocoa beans. *Cafe Cacao The.* 24(1); 1980; 43-56 (French)

Extensive drying experiments have enabled the authors to plot drying curves under varying conditions of rate of air-flow, temperature of air, and thickness of the cocoa bean layer. Transfer coefficients during the period of drying at a constant rate have been calculated, as also the resistance to drying and diffusion for the period of slow drying. The recommended drying conditions are : temp. 65-70°C; rate of air-flow 0.4-0.5 m/s. Caking is avoided under these conditions. The quality of artificially dried and of sun-dried cocoa beans, as well as of the cotyledons and chocolate have been compared. The samples prepared from sun-dried beans were found to be superior. Artificial drying does not



affect the bitterness and aroma of the chocolate, but significantly increases the acidity and astringency, and the residual quantity of bacteria and yeasts. KMD

## Alcoholic Beverage

### Wine

- 204 BATES (RP), MILLS (D), MORTENSEN (JA) and CORNELL (JA). Prefermentation treatments affecting the quality of muscadine grape wines. Am. J. Enol. Vitic. 31(2); 1980; 136-143

The prefermentation treatments involved in the quality of muscadine (*Vitis rotundifolia*) wines prepared from 35 fermentations of 14 pickings from Florida grown bronze and black var. of grapes were studied. Treatments included crushing grapes and immediately maintaining on pomace 0-72 hr and various hot regimes. Data have been reported on must and/or juice yield, Brix, pH, total acid, tannins colour sensory scores on six month old wines. Data correlated significantly with yield, acidity and tannins and colour with time on pomace and hot press severity. Means for establishing pressing regimes based on analyser of crush and derived characterisation of wine have been suggested by regression equations. BSN

- 205 COOTES (RL), ROGERS (PL) and LEE (TH). Continuous wine fermentation: a review. Food Technol. Aust. 32(5); 1980; 242-248

Design of a fermentor, its performance, control of continuous fermentation, continuous fermentation for production of various styles of wine like table wine, sparkling wine, flor sherry and apple cider have been covered. KAR

- 206 ESCHENBRUCH (R) and CRESSWELL (KJ). Methyl anthranilate - the occurrence in some New Zealand wines. Food Technol. NZ 15(4); 1980; 13-17

In New Zealand hybrid wines the amount of methyl anthranilate (MA) varies with the variety, vintage and wine making procedure. The hybrid character in such wines is apparently only in part due to MA. The MA content can be reduced by fining agents, activated charcoal, and bentonite with the last one being the most effective. The concentration of grape juice removes MA completely. KAR

- 207 SACHDE (AG), EL-ZALAKI (EM), EL-TABEY (AM) and ABO-DONIA (SA). Study on Egyptian fresh and aged wines. III. Alcohol, aldehydes, reducing sugars, total soluble solids, tannin, and coloring matter content. Am. J. Enol. Vitic. 31(2); 1980; 165-169

Data collected have shown that bottled white and red wines contained about 12% alcohol, while soluble solids content showed a similar trend as that of reducing sugars. According to age of wines, decreases in total phenolics (tannin) and colouring matter were observed. Red wines showed higher amounts of tanning than white wines. BSN

- 208 STAN KUNG (M), RUSSELL (GF), STACKLER (B) and DINSMOOR WEBB (A). Concentration changes in some volatiles through six stages of a Spanish-style solera. Amer. J. Enol. Vitic. 31(2); 1980; 187-191

Volatiles from six stage fractional blending solera at the university of California, on solvent extraction, concentration and GC analysis were identified by combined, computerized GC-MS and GC retention index data. Twenty of the 31 components for which quantitative data were available have been identified. BSN



## OILS AND FATS

## Oil

- 209 ANALYTICAL METHODS COMMITTEE. Application of Gas-liquid chromatography to the analysis of Essential oils. Part VII. Finger-printing of essential oils by temperature-programmed gas-liquid chromatography using a carbowax 20M stationary phase. Analyst. 105(1248);1980; 262-273
- 210 BOSKOU (D) and KATSIKAS (H). Effect of olive oil hydrocarbons and triterpene alcohols on the stability of heated cotton seed oil. Acta Aliment. 8(3); 1979; 317-319

Triterpene alcohols and hydrocarbons isolated from virgin olive oil were added to cotton seed oil in small concentrations. The oil was subjected to heating at 180°C for several hours and oxidative polymerization was followed by the changes in iodine values, refractive indices, palmitic/linoleic acid ratios and viscosity. The triterpene alcohols of olive oil increased the stability of the heated oil. The hydrocarbon fraction had a similar but less pronounced effect. AA

- 211 SOOS (K). Occurrence of 3,4-benzopyrene in fats and heat-induced changes in its concentration. Acta Aliment. 8(2); 1979; 181-188

The content of 3,4-benzopyrenes in various edible oils, margarines, and hardened oils made in Hungary was found to lie in the range of 1-11 µg/kg, which is higher than the permissible level. A revision of vegetable oil manufacturing technology appears to be necessary. Heating of sunflower-seed and rapeseed oils, to 250-300°C both in the laboratory and in fish and dough frying shops, reduced their 3-4 benzopyrene content. When heated to lower temperature-like 120°C, for potato frying, the benzopyrene content of the oil may increase, because degradation is lower than the rate of formation. KMD

## SPICES AND CONDIMENTS

- 212 VARSANYI (I), LIPTAY (G), FARKAS (J) and PETRIK-BRANDT (E). Thermal analysis of spices decontaminated by irradiation. Acta Aliment. 8(4); 1979; 397-405

The most frequently used spices, viz., ground paprika, black pepper, and a mixture of seven spices, were subjected to a radiation dose of 1.5 Mrad (15KGy). Thermal analysis showed that such a dose did not show significant changes in the constituents of spices, which would adversely affect their utilization. KMD

## Horse radish

- 213 MAZZA (G). Thermodynamic considerations of water vapour sorption by horseradish roots. Food Sci + Technol. 13(1); 1980; 13-17

## Mustard

- 214 CATALDI (C). The Mustard. Ind. Aliment. 18(164); 1979; 609-616 (Italian)

After a general discussion of the characteristics and chemical composition of mustard, the author deals with the definition and preparation of table mustard. There is no legislation in Italy at present relating to table mustard. As regards formulation of a standard specification, the author makes the following points: (1) it is not possible to distinguish between "table mustard" and "mustard condiment"; (2) the addition of starchy substances and stabilizers is permitted; (3) addition of various sulphites is not permitted, although they may be present in other ingredients of table mustard; and (4) it is not possible to specify any



## Ginger

- \*215 RAGHUVVEER (KG) and GOVINDARAJAN (VS). Evaluation of spices and oleo-resins VII. Gas chromatographic examination of gingerol, shogaol and related compounds in ginger. *J. Food Qual.* 2(1); 1978; 41-54

The products of thermal degradation of gingerols, the pungent component of the spice ginger under gas chromatographic conditions have been re-examined. Besides breakdown to zingerone and aldehydes, substantial dehydration of gingerols to shogaols has been established by improved gas chromatographic separation. The identity of the pungent and poorly pungent homologs have been clearly established as (6)- and (8)-, and (10)-gingerols/shogaols respectively. Programmed temperature gas chromatography combined with thin-layer chromatographic separation has provided a method for determining the ratio of the homologs and a possible method for estimation of gingerols and shogaols in ginger oleoresin. AA

## Paprika

- \*216 CHAUBEY (RC), KAVI (BR), BARNA (J), CHAUHAN (PS) and SUNDARAM (K). Cytogenetic studies with irradiated ground paprika as evaluated by the micronucleus test in mice. *Acta Aliment.* 8(2); 1979; 197-201

Ground paprika irradiated with 3 Mrad proved to be non-clastogenic, as shown by the micronucleus test on mice that were fed paprika at a level of 20% dry wt, in a semi-synthetic diet. Irradiated paprika does not influence the cell proliferative activity of the bone marrow, as measured by the P/N ratio. KMD

- 217 KARIMIAN-TEHERANI (D), KISS (I) and TEHRANI (N). Determination of Cl, K, Rb, Zn, Se, and Hg in paprika by neutron activation analysis. *Acta Aliment.* 8(2); 1979; 189-195

Various samples of Hungarian spice paprika (powdered) were analyzed for their Cl, K, Rb, and Zn contents. Samples of paprika both with and without seeds were studied. The values are reported in ppm (dry weight). Statistical analysis showed significant differences in the trace element contents between most cultivars. The content of the trace elements Cl, K, Se, and Hg was lower in the seeds than in the whole fruit, while that of Zn was higher; the Rb content of the seeds was the same as in the whole fruit. The concentrations of Hg and Se were below the threshold level of 0.04 ppm. KMD

- 218 SZABAD (J) and KISS (I). Comparative studies on the sanitizing effects of ethylene oxide and of gamma irradiation on ground paprika. *Acta Aliment.* 8(4); 1979; 383-395

An ionizing radiation dose of 5 k Gy was as effective as treatment with ethylene oxide (600 g/m<sup>3</sup>, 25°C, 6h) in reducing the mesophilic aerobic cell count (2.5 orders of magnitude). The cell count can be reduced still further by doses greater than 5 k Gy. No coliform bacteria, nor any *E. coli* could be detected in ground paprika subjected to either of the above treatments. But irradiation reduced the mould count also, while ethylene oxide treatment did not. The colour of the ground paprika was not affected by either of these treatments. Thus, the fumigation treatment, which leaves behind chemical residues, can be safely replaced by an irradiation treatment. KMD

## SENSORY EVALUATION

- 219 BIRCH (GG), LATYMER (Z) and HOLLAWAY (M). Intensity/time relationships in sweetness: evidence for a queue hypothesis in taste chemoreception. *Chem. Senses.* 5(1); 1980; 63-78



- 220 FINNEY (EE) Jr. and ABBOTT (JA). Methods for testing the dynamic mechanical response of solid foods. J. Food Qual. 2(2); 1978; 55-74

Techniques for measuring mechanical resonance, vibration transmissibility, pulse propagation velocity, and the resilience or rebound characteristics of solid food commodities are reviewed. Emphasis is placed upon measurements of the dynamic elastic properties of foods and changes in these properties as food products lose their stiffness, rigidity, or firmness. Correlations of certain elastic properties with product quality, especially texture, are presented, and a number of nondestructive dynamic methods for sorting food commodities are described. AA

- 221 O'MAHONY (M) and MANZANO ALBA (MC). Taste descriptions in Spanish and English. Chem. Senses. 5(1); 1980; 47-62
- 222 PAULUS (K) and HAAS (E). The influence of solvent viscosity on the threshold values of primary tastes. Chem. Senses. 5(1); 1980; 23-32
- 223 PAULUS (K) and REISCH (AM). The influence of temperature on the threshold values of primary tastes. Chem. Senses. 5(1); 1980; 11-21
- 224 POMPEI (C). Sensory perception and evaluation of food texture. Ind. Conserv. 54(4); 1979; 273-295 (Italian)

Texture is a quality parameter for a large number of foodstuffs, instrumental measures of texture must be related to sensory evaluations: the study of such relations is called psychorheology. In this review problems involved in sensory perception and evaluation of texture are analyzed in regard to the correlation between these measures and the physical ones. AA

## FOOD STORAGE

- 225 ANON. Cryogenic technology. Food Technol. NZ. 15(4); 1980; 39-47
- Aspects covered include the use of cryogenic technology for storing frozen foods and powdering foodstuffs for recycling or to produce them in granule form. KAR
- 226 RUZMIN (MP). Current problems in refrigeration technology of foodstuffs. Int. J. Refrig. 3(3); 1980; 157-159

The principal topics discussed in this paper are: The use of much lower temperatures than are now generally accepted for the storage of vegetable produce, the lower temperatures being attained very gradually. Improved storage is attributed to changes in fatty acids and phospholipids; reduction in the energy requirements for grinding foodstuffs, eg meat, by freezing the product before grinding; and increasing use of prepared or semi-prepared foodstuffs, leading to reduction of labour requirements in catering establishments. AA

- 227 SALUNHE (DK), DO (JY) and GIFFEE (JW). Effects of long-term storage on quality of processed foods 1. Meal, Ready-to-eat, individual ration items packed in flexible retortable pouches. J. Food Qual. 2(2); 1978; 75-103

Experiments were conducted on the effects of long-term storage at 4.4, 21.1, and 37.8°C temperatures on nutritional quality, physico-chemical characteristics and organoleptic quality of 8 food packets (ready-to-eat individual ration items processed in flexible retortable pouches) of ham and chicken loaf, beef steak, beef stew, frankfurters, fruit cake, pineapple slices, cheese spread, and chocolate brownies. At 37.8°C storage life of cheese spread, pineapple slices, beef stew,



chocolate brownies and fruit cake was 12, 12, 30 and 30 months respectively. Ham and chicken loaf, beef steak, and frankfurters were acceptable after 37.8°C storage for 54 months, but frankfurters were near the borderline of rejection. The browning is usually associated with the high temperature storage of high sugar foods. Meat products except beef stew are apparently more stable than others at high temperature storage. The high temperature storage resulted in drastic loss of thiamin and ascorbic acid, significant loss of riboflavin and niacin, and discoloration and rancidity. Despite the losses of quality observed in all food packets stored at 21.1°C for 54 months, they were acceptable. Storage at 4.4°C for 54 months had very little effect on quality of the food packets and were highly acceptable. AA

- 228 SYMONS (HW). The applicability of open date marking for quick frozen food. Int. J. Refrig. 3(3); 1980; 167-170

Various types of open data marking are described and discussed, relating each to the various stages in the cold chain. The importance of ensuring that all the components of a final package are always maintained at the correct storage temperature is emphasized rather than total time in storage. KAR

- 229 THORNE (S) and MEFFERT (HF Th). The storage life of fruits and vegetables. J. Food Qual. 2(2); 1978; 105-112

Exponential curves have been fitted to published temperature/time/quality data for both fresh and frozen fruits and vegetables. The two constants in the exponential equation are used as measures of the relative storage life of the product and of its sensitivity to temperature change. Of these 2 constants, 1 is analagous to the "Q<sub>10</sub>" value often used to express temperature sensitivity, but it is independent of actual temperature. The two constants are used to provide an index of "storability" of different fruits and vegetables and a tentative classification of produce according to this "storability" is presented. Fitting curves to temperature/time/quality data also allows prediction of the effects on storage life of fluctuating product temperatures, such as are experienced during normal transport and storage. AA

## INFESTATION CONTROL AND PESTICIDES

### Infestation control

- 230 BELL (CH), SPRATT (EC) and MITCHELL (DJ). The effect of nitrogen and carbondioxide on eggs of *Ephestia cautella* (Walker) and *E. kuehniella* Zeller (Lepidoptera: Pyralidae). Bull. Entomol. Res. 70(2); 1980; 293-298

- 231 GINEVAN (ME) and LANE (DD). A gas exposure system for insects. J. Econ. Entomol. 73(1); 1980; 46-48

An economical, compact and reliable system for chronic low level exposure of insects to air contaminants, which is based on use of permeation tubes, a novel concept in entomological research. The system may be useful in long term constant temperature, low level fumigation studies involving a variety of gases. BSN

- \*+232 QADRI (SSH) and BRAHMANAD RAO (BH). Effect of oleoresin in combination with neem seed and garlic clove extracts against household and stored products pests. Pesticides. 14(3); 1980; 11-14

Oleoresin, an extract from the *chrysanthenum* flower is a dark viscous extract having approximately 30% pyrethrins. The oleoresin in combination with neem and garlic has shown synergistic action against house fly (*Musca domestica* nebulosa Fabr.), pulse beetle (*Callosobruchus chinensis* F.) and lesser grain borer (*Rhizopertha dominica*). BSN



## Pesticide

- 253 ANON. The pattern of uses of pesticides in America. Pesticides. 14(4); 1980; 3-5
- 254 BAKER (PG), FARRINGTON (DS) and HOODLESS (RA). Part VII. Determination of residues of Fentin in vegetables and cocoa products by spectrofluorimetry. Analyst. 105(1248); 1980; 282-285
- The method proposed is based on vernon's fluorometric procedure wherein instead benzene for complex formation tanlene is used. For cocoa products, a simple shaking procedure with acetonitrile was devised. The extract obtained from vegetables or cocoa products was cleaned up on a alumina column to remove co-extractives that quenched florescence of the fentin-3-hydroxy flavone complex and this apparatus read to low recoveries. BSN
- 32 FAIRALL (RJ) and SCUDAMORE (KA). Determination of residual methyl bromide in fumigated commodities using derivative gas-liquid chromatography. Analyst. 105(1248); 1980; 251-256
- The sensitive method proposed involves conversion of methyl bromide stoichiometrically into methyl iodide by reaction with sodium iodide and analyses by GLC with electron capture detection. Residual methyl bromide was detectable upto  $10 \mu\text{g Kg}^{-1}$  in a number of foodstuffs. BSN
- \*+236 FREDRICK (SJ). Pesticide industry: prospects & problems. Seeds Farms. 6(1); 1980; 19-21
- \*+237 JALEES (K). The pesticide threat. Sci. Rep. 17(5); 1980; 316-321
- \*\*238 MUTHU (M), KRISHNAKUMARI (MK), MURALIDHARA and MAJUMDER (SK). A study on the acute inhalation toxicity of phospine to albino rats. Bull. Environ. Contam. Toxicol. 24(3); 1980; 404-410

The  $\text{LC}_{50}$  values of  $\text{PH}_3$  for male albino rats administered Aluminium phosphide pellets (approx. 0.69 yielding 0.2 g  $\text{PH}_3$ ) ranged from 0.22 mg/hr/L ( $27^\circ\text{C}$ ) to 0.36 mg/hr/L ( $26.1^\circ\text{C}$ ) with repeated exposure periods of 5.2 to 7.4 hours respectively for products A & B employed, whereas for  $\text{LC}_{95}$  these were 0.42 and 0.49 mg.hr/L with exposure periods of 6.2 and 8.8 hr. resp. Mostly lungs showed congestion as a result of phosphine intake in albino rats. BSN

- 239 OLSON (KL), BOUSH (GM) and MATSUMURA (F). Pre- and postnatal exposure to dieldrin: Persistent stimulatory and behavioral effects. Pestic. Biochem. Physiol. 13(1); 1980; 20-33
- 240 REDFERN (R) and GILL (JE). Laboratory evaluation of bromadiolone as a rodenticide for use against warfarin-resistant and non-resistant rats and mice. J. Hyg. 84(2); 1980; 263-268

At 0.005% bromadiolone complete kills of *R. norvegicus* and *R. rattus* not resistant to warfarin were obtained after exposure to the poison for 1 and 5 days respectively. Warfarin-resistant *R. norvegicus* were all killed in 4 days, and resistant *M. musculus* in 12 days. Acceptance of bromadiolone was very good. KAR

## BIOCHEMISTRY AND NUTRITION

## Biochemistry

- 241 VARANINI (Z), PALLAVICINI (C), FINCATI (G) and DAL BELIN PERUFFO (A). Yield improvement in plastein synthesis with immobilized enzymes. Ind. Aliment. 18(165); 1979; 735-740 (Italian)



A study was carried out to establish optimal conditions for plastein synthesis with immobilized enzymes. Preliminarily, the optimum pH of both  $\alpha$ -chymotrypsin and papain was determined. Successively, with the enzyme more productive ( $\alpha$ -chymotrypsin) at its optimum pH (5); the plastein productivity of three substrates progressively enriched with larger peptides ( $\leq 600$ ,  $\leq 1700$ ,  $\leq 3600$  daltons) was ascertained. The synthesis done with the first two substrates, passed through the columns continuously for 72 hr at a flow rate of 20.30 ml/hr gave yields of 35% higher compared to those obtained by synthesis, performed as the control, with free enzyme. The results concerning the yield and the amino acid composition of final products are discussed with the literature data on plastein synthesized with free enzymes. AA

### Nutrition

- 242 AL-ANI (MR). Diet and dietary habits of nomads in Iraq. Ecol. Food Nutr. 9(1); 1980; 55-57

- 243 Den HARTOG (AP). Nutrition activities in a developing situation. Voeding. 40(3); 1979; 121-122 (Swedish)

- 244 Den HARTOG (AP) and DAMEN (PJC). Food aid programmes and nutrition. Voeding 40(3); 1979; 140-148 (Swedish)

The author finds that food aid (e.g. skim milk powder) meant for supplementary feeding programmes reaches the target groups only when the programmes have been developed from below with the people's participation. The most critical points - in the long run - in planning and evaluating supplementary feeding programmes appear to be (a) the discrepancy between available donated foods and the local food habits, (b) the required duration of the programme, and (c) the possibilities of gradually replacing the food aid with local resources. KMD

- 245 EDEMA (JMP). Nutrition education in the background of food habits. Voeding 40(3); 1979; 135-139 (Swedish)

- 246 FARRER (KTH). Nutrition as a factor in marketing. Food Technol. Aust. 32(5); 1980; 236-240

How nutrition is used positively, wrongly and negatively, what regulations had to be imposed to control its use and the response which have been induced by the current consumer have been covered. KAR

- \*+247 GANGULI (NC). Immunity in infants through maternal milk. Indian Dairyman. 32(9); 1980; 703-705

Evidence from different sources in regard to immune bodies present in milk and role in protection of infants are presented. Breast feeding is stressed to be the most appropriate way in this respect. MVG

- 248 GROOT (EH) and Den HARTOG (C). Documentation relating to nutrition of elderly persons. Voeding 40(1); 1979; 1-11 (Swedish)

- 249 HOOD (RL) and JOHNSON (AR). Supplementation of infant formulations with biotin. Nutr. Rep. Int. 21(5); 1980; 727-731

The biotin levels in milk powders and in commercial infant formulations manufactured in Australia and U.K. are given. Some formulations, particularly those based on cow's milk and modified to simulate human milk, contained low levels of biotin. It is recommended to the inclusion of biotin in vitamin supplements recommended for nursing mothers. KAR

- 250 KROMHOUT (D). Epidemiological nutritional surveys in nursery and primary school children. Superfluous or necessary? Voeding 40(3); 1979; 101-107 (Swedish)



- 251 KAWABASHI (D), PELLET (PL), BASHA (HM) and DJANI (F). Observations on nutritional marasmus in a newly rich nation. *Ecol. Food Nutr.* 9(1); 1980; 43-53

- 252 STASSE-WOLTHUIS (M), Van JEVEREN (JGC), HERMUS (RJJ) and KATAN (MB). Effects of high-fibre diets on cholesterol metabolism and colonic function in man. *Voeding* 40(3); 1979; 107-112 (Swedish)

Short-term, controlled experiments with fibre-rich foodstuffs have only a small (vegetables and fruits) or no (bran) favourable effect on the level of serum cholesterol. However, in uncontrolled circumstances, a "natural", high-fibre diet may indirectly reduce the concentration of serum cholesterol through its low fat and cholesterol content. High fibre diets increased the faecal wet weight, by 115 g/day on an average, and decreased the mean transit time through the gut by 18 h. The higher consumption of potassium on the diet containing vegetables and fruit was not accompanied by a lowering of blood pressure. KMD

- 253 SWAAN (AJ). A preliminary investigation into the nutrition of infants, during the first 6 months of life, in the North Brabant. *Voeding* 40(4); 1979; 154-156 (Swedish)

- 254 Ter HAAR (GI), De BEKKER (GJPM) and HAMMINK (J). The basic five: An ideal food grouping system? *Voeding* 40(2); 1979; 34-41 (Swedish)

## TOXICOLOGY AND HYGIENE

### Toxicology

- 255 BERNDT (WO) and MEHENDALE (HM). Effects of hexachlorobutadiene (HCB) on renal function and renal organic ion transport in the rat. *Toxicology*. 14(1); 1979; 55-65

- 256 EMBER (LR). Nitrosamines: assessing the relative risk. *Chem. Eng. News*. 58(13); 1980; 20-26

Different sources from which nitrosamine exist in the body and in the environment and their toxicity to human beings from these sources have been covered. KAR

- 257 GELOSA (L) and CIGADA (F). Thermonuclease as pathogenetic test of staphylococci. *Ind. Aliment.* 18(163); 1979; 548-550 (Italian)

- 258 GROGER (JAL) and GREY (TF). Effect of chloroform on the activities of liver enzymes in rats. *Toxicology*. 14(1); 1979; 23-38

- 259 HAGGBLOM (P) and UNESTAM (T). Blue light inhibits mycotoxin production and increases total lipids and pigmentation in *Alternaria alternata*. *Appl. Environ. Microbiol.* 38(6); 1979; 1074-1077

- 260 KOK (FJ). Investigation of the knowledge, attitude, and behaviour of the Dutch population about risk factors of cardiovascular diseases. *Voeding* 40(3); 1979; 134-135 (Swedish)

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(Getreide-Mehl Brot.)
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 (Yojana)  
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 und Forschung (German)  
 (Z. Lebensmittel-Unters. Forsch.)



# I N D E X

- Acetate
  - juice, enzymic analysis 199
  - wine, enzymic analysis 199
- Aegle marmelos (see) Bael fruit
- Agricultural management 6
- Agriculture
  - (in) India 1980's 15
- Albino rat
  - phospine toxicity 238
- Alcohol
  - cheddar cheese, whey, yeast production 140
- Alternaria alternata
  - mycotoxin production 259
- Amino acid
  - orange, juice, effect of processing 99
- Aminotransferase enzyme
  - (in) fish 176
  - (in) shell fish 176
- Apple
  - fruit, sensory character 103
  - juice 102
- Aroma compound
  - extraction (using) liquid gas 34
- Arsenic
  - seaweed, toxicity, evaluation 266
- ATPase activity
  - sardine, myofibrillar protein, effect of storage 183
- Autoradiography
  - Cheese, microorganism, localization 141
- Bacteria
  - Cheese, localization, autoradiography 141
  - meat, growth effect of carbon dioxide 150
  - (in) milk, enumeration 199, 122
  - potassium hydroxide, differentiation 48
- Bael fruit 101
- Banana
  - drying, solar energy 93
- Beef
  - lysine, content, effect of storage 153
  - (fed) pentachlorophenol, dioxin level 155
  - storage, effect of microbial contamination 154
- Benzoic acid
  - citrus, juice, determination 97
- Benzopyrene
  - (in) oil 211
- Biomass
  - (for) energy 12
- Biotin
  - infant formulation, supplementation 249
- Biscuit
  - dietetic, E-alpha-tocopherol 107
- Bis-(trichloromethyl) disulfide, strawberry, detection 95
- Bisulphite,
  - shell fish, canned, residue 189
- Bread fruit
  - chemical analysis 88
- Breakfast cereal 63
- Broiling
  - effect on fish, product, nitrosamine 178
- Bromadiolone
  - rodenticide, evaluation 240
- Butter
  - butylated hydroxy anisole stability, effect of temperature 136
  - (from) EEC, control 137
- Butter milk
  - (as) human food 133
- Butter oil
  - icecream, production utilization 135
- Butylated hydroxy anisole
  - (in) butter, stability effect of temperature 136
- Calcium
  - food, spectrometry, analysis 39
  - (in) dairy product 112
  - water, spectrometry, analysis 39
- Canned
  - fish, biochemical changes (during) transportation 182
  - prawn, spoilage 190
  - seafood, TVN concentration, effect of meat, quality 175
  - shell fish, bisulphite, residue 189
- Canning
  - energy, conservation, industry 22
- Carbohydrate
  - iron, determination 33
- Carbondioxide
  - effect on meat, bacteria, growth 150
- Casein
  - milk (Friesian) composition 115
- Casein-carrageenan fibre
  - composition, effect of coagulation bath 192
  - solubility, modification 194
  - texture, effect of coagulation bath composition 192
  - texture, effect of freeze thaw cycle 193
- Catfish
  - fillet, cold storage 186
  - fillet, freezing 186
- Cheddar cheese whey
  - yeast, alcohol, production 140
- Cheese
  - microorganism, autoradiography localization 141
  - mycotoxin 139
- Chicken
  - fecal, contamination, spray cleaning 162
  - meat, composition 159
  - mechanically deboned, meat, composition 160



- Chicken (contd.)
  - mechanically deboned meat, nutritive value 160
- Chilli
  - insecticidal, property, 87
- Chlorinated water
  - effect on meat 145
- Chlorine
  - Paprika, analysis 217
- Chloroform
  - effect on rat, liver enzyme 258
- Chlorophenoxvetic acid
  - effect on grape, composition 92
- Cholesterol  $\alpha$ -oxide
  - (in) egg, estimation 169
- Citrus
  - fruit, marketing 96
  - fruit, production 96
  - juice, ascorbic acid, determination 97
  - juice, benzoic acid, determination 97
  - juice, sorbic acid, determination 97
- Cleaning
  - grain 25
- Clostridium bifermentans
  - spore, effect of sporulation medium 53
- Clostridium perfringens
  - meat, germination, effect of nisin 144
  - meat, germination, effect of nitrite 144
- Coagulation bath
  - effect on casein - carrageenan fibre, composition 192
  - effect on casein- carrageenan fibre texture 192
- Cocoa bean
  - drying 203
- Cola flavoured beverage 201
- Cold storage
  - catfish, fillet 186
- Composition
  - grape, effect of 4-chlorophenoxvetic acid 92
  - grape, effect of defoliation 92
  - grape, effect of gibberellic acid 92
- Computer programming
  - (in) food industry 13
- Conservation
  - canning, energy, industry 22
- Contamination
  - chicken, fecal, spray cleaning 162
  - fish, vibrioparahaemolyticus 180
  - microbial, effect on beef, storage 154
  - Salmonellae, sausage production 173
  - yeast, lipid, analysis 41
- Continuous fermentation
  - wine, review 205
- Continuous flow louvred bed driers 24
- Cooking
  - effect on sorghum, tannin 71
- Cost
  - (of) milk, production 124
- Cotton seed oil
  - stability, effect of olive oil, hydrocarbon 210
  - stability, effect of triterpene alcohol 210
- Carp
  - organoleptic evaluation 185
- Cryogenic technology 225
  - Cucurbita-5,24-dien-3, -ol (from) gourd seed oil 89
- Dairy industry
  - pollution control 111
- Dairy processing plant
  - heat loss 109
- Dairy product
  - calcium content 112
  - texture, measurement 110
- Debranned
  - triticale 68
- Debranning
  - triticale, nutritive value 67
  - triticale, sensory evaluation 67
- Decontaminated
  - spice, thermal analysis 212
- Defoliation
  - effect on grape, composition 92
  - effect on grape, growth 92
- Diieldrin
  - behavioral effect 239
  - stimulatory effect 239
- Diet (cereal based)
  - iron, availability 64
- Dietary habit
  - (of) nomad (in) Iraq 242
- Dietetic
  - biscuit, E-alphatocopherol 107
- Dioxin level
  - beef (fed), pentachlorophenol 155
- Drying
  - banana, solar energy 93
  - cocoa bean 203
  - grain 25
- Duck
  - egg, quality 163
- Edible meat
  - freezing 148
- Egg
  - Australorps, production 167
  - Cholesterol  $\alpha$ -oxide, estimation 169
  - duck, quality 163
  - Ephestia cautella, effect of nitrogen 230
  - product, pasteurized, faecal streptococci, survival 166
  - shell, washing (using) ovosan 168
  - white leghorn, production 167



- Endo-polygalacturonase
  - effect on vegetable, juice,
  - protein, availability 79
- Energy
  - canning, conservation, industry 22
  - (from) biomass 12
- Enzyme gelling
  - effect of milk protein concentra-
  - tion 118
- Enzymic analysis
  - acetate, juice 199
  - acetate, wine 199
- Ephestia cautella
  - egg, effect of nitrogen 230
- Essential oil
  - gas-liquid chromatography ana-
  - lysis 209
- Ethanol 11
- Ethylene oxide
  - effect on ground paprika 218
- Fentin
  - vegetable, residue, determi-
  - nation 234
  - vegetable, residue, spectro-
  - fluorimetry, determination
  - 77
- Fillet
  - catfish, cold storage 186
- Fish
  - aminotransferase enzyme 176
  - canned, biochemical changes
  - (during) transportation 182
  - product, nitrosamine content
  - effect of broiling 178
  - product, quality, control 181
  - sodium chloride, absorption 179
  - storage, oxidation - reduction
  - potential changes 177
  - vibrioparahaemolyticus conta-
  - mination 180
- Fluoride
  - seafood, content, determination
  - 174
- Food
  - Bacillus cereus 264
  - calcium, content, spectrophoto-
  - metry, analysis 39
  - industry, programming 13
  - irradiated, study 2
  - legislation 9, 10
  - nitrate, determination 30
  - nitrate, determination 30
  - processed, quality, effect of
  - storage 227
  - refrigeration 226
- Food Science
  - conference, Budapest
- Freeze thaw cycle
  - effect on casein-carrageenan
  - fibre, texture 193
- Freezing
  - catfish, fillet 186
  - (of) edible meat 148
- Frog
  - te
  - utilization 191
- Fruit
  - apple, sensory character 103
  - citrus, marketing 96
  - citrus, production 96
  - juice, malic acid, high pressure
  - liquid chromatography, determina-
  - tion 200
  - juice, tartaric acid high pressure
  - liquid chromatography, determina-
  - tion 200
  - storage life 229
- Garlic
  - extracts (as) insecticide 82
- Gas chromatography
  - ginger, gingerol, evaluation 215
  - ginger, shogaol, evaluation 215
- Gas exposure system
  - insect 231
- Gas-liquid chromatography
  - essential oil, analysis 209
  - methyl bromide, determination 235
- Germination
  - meat, Clostridium perfringens effect
  - of nisin 144
  - meat, Clostridium perfringens effect
  - of nitrite 144
- Gibberellic acid
  - effect on grape, composition 92
  - effect on grape, growth 92
- Ginger
  - gingerol, gas chromatography, eva-
  - uation 215
  - shogaol, gas chromatography, evalua-
  - tion 215
- Gingerol
  - ginger, gas chromatography, evaluation
  - 215
- Gourd seed oil
  - $\alpha$ -cucurbita-5, 24-dien 3/3-ol, 89
- Grain
  - cleaning 25
  - drying 25
  - handling 25
  - storage (in) Bangladesh 65
- Granulation
  - effect on mandarin, chemical character
  - 100
  - effect on mandarin, physical character
  - 100
- Grape
  - Composition, effect on 4-chloropheno-
  - xyacetic acid 92
  - composition, effect on defoliation 92
  - composition, effect of gibberellic acid
  - 92
  - growth, effect of 4-chlorophenoxyacetic
  - acid 92
  - growth, effect of defol + 92
  - growth, effect of globe 1 acid 92
  - juice, extraction effect of pectin 91
  - juice, effect of pH 198
  - juice, effect of potassium 198
  - juice, effect of sodium 198
  - wine, quality 90



Grape must  
   yeast, growth 45  
 Green revolution  
   (in) India 14  
 Growth  
   grape effect of 4-chloropheno-  
   xyacetic acid 92  
   grape, effect of defoliation 92  
   grape, effect of gibberellic acid  
   92  
 Handling  
   grain 25  
 Heat treatment  
   milk, nutritive value 126  
 High pressure liquid chromatography  
   fruit, juice, malic acid deter-  
   mination 200  
   fruit, juice, tartaric acid,  
   determination 200  
   legume, sugar, estimation 72  
 Horseradish root  
   water vapour sorption 213  
 Icecream  
   butter oil, production, utili-  
   zation 135  
 Industry  
   canning, energy, conservation 22  
   meat, microbiological safety 143  
   pesticide 236  
 Infant formulation  
   biotin, supplementation 249  
 Insect  
   gas exposure system 231  
 Insecticide  
   chilli, property 87  
   (from) garlic, extraction 82  
 In-store packaging 19  
 Intermediate moisture food 35  
 Iodine  
   milk, determination 121  
 Iron  
   carbohydrate, determination 33  
   diet (cereal based), availability  
   64  
   effect on pecan, kernel 76  
 Irradiated  
   food 2  
   paprika, micronucleus test 216  
 Irradiation  
   effect on ground paprika 218  
 Iso-glucose  
   sweetner 56  
 Juice  
   acetate, enzymic analysis 199  
   apple 102  
   citrus, ascorbic acid determina-  
   tion 97  
   citrus, benzoic acid determina-  
   tion 97  
   citrus, sorbic acid determination  
   97

Juice (contd.)  
   fruit, malic acid, high pressure  
   liquid chromatography, determina-  
   tion 200  
   fruit, tartaric acid high pressure  
   liquid, chromatography, determina-  
   tion 200  
   grape, extraction, effect of pectin  
   91  
   grape, effect of pH 198  
   grape, effect of pottassium 198  
   grape, effect of sodium 198  
   orange, amino acid effect of processing  
   99  
 Kernel  
   pecan, colour, effect of iron 76  
 Khoa  
   (from) goat milk utilization 132  
 Lactose  
   whey, production 138  
 Lamb  
   meat, nutritive value 156  
 Legume  
   sugar, high pressure liquid chromato-  
   graphy, estimation 72  
 Lipid  
   buffalo, milk, 130  
   yeast, contamination, analysis 41  
 Liquid gas  
   (in) aroma, compound, extraction 34  
 Liver  
   rat, enzyme, effect of chloroform 258  
 Localization  
   cheese, microorganism autoradiography  
   141  
 Lysine  
   (in) beef, effect of storage 153  
 Malic acid  
   fruit juice, high pressure liquid  
   chromatography, determination 200  
 Mandarin  
   chemical chracteristics effect of  
   granulation 100  
   physical characterisation effect of  
   granulation 100  
 Marketing  
   citrus, fruit 96  
   milk 114  
 Meat  
   bacteria, growth, effect of carbon-  
   dioxide 150  
   chicken, composition 159  
   chicken, mechanically deboned,  
   composition 160  
   chicken, mechanically deboned, nutri-  
   tive value 160  
   Clostridium perfringens, germination  
   effect of nisin 144  
   clostridium, perfringens germination,  
   effect of nitrite 144



## Meat (contd.)

- effect of chlorinated water 145
- freezing 148
- microbiological safety, industry 143
- lamb, nutritive value 156
- nickel content, determination 151
- nitrate, determination 146
- nitrite, determination 146
- protein, content, determination 149
- quality, seafood, canned effect on TVN concentration 175
- waterbinding capacity, measurement 152
- Mechanically deboned
  - chicken, meat, composition 160
- Methyl anthranilate
  - (in) wine 206
- Methyl bromide
  - residue, gas-liquid chromatography, determination 235
- Microbial contamination
  - effect on beef storage 154
  - meat, industry 143
  - turkey, carcasse 164
- Microbial technology
  - (in) developing countries 43
- Micronucleus test
  - paprika, irradiated 216
- Microsomal degranulation
  - tea, tannin 202
- Microwave cooking rate
  - effect on pork palatability 158
- Milk
  - bacteria, enumeration 119, 122
  - buffalo, lipid 130
  - buffalo, phosphorous, effect of sterilization 131
  - cow, composition 128-129
  - cow, polyacrylamide gel electrophoresis, characterization 127
  - cow, staphylococci 117
  - friesian, casein, composition 115
  - goat, khoa, utilization 132
  - iodine, determination 121
  - marketing 114
  - nutritive value, effect of heat treatment 126
  - production, cost 124
  - sourage, problem 123
  - sterilized, sterility control, period 120
  - village level chilling 113
- Milk fish
  - storage 188
- Milk powder
  - spray-dried, acidophilus 142
- Milk protein concentration
  - effect of enzyme gelling 118
- Mineral
  - vegetable, evaluation 78
  - yeast, (candida) content 49

## Mortadella

- sausage, (using) non-meat animal protein 171
- sausage, (using) vegetable protein 171
- Muscadine grape wine (See) wine
- Mustard 214
- Mycotoxin
  - Alternaria alternata, production 259
  - (in) cheese 139
- Myofibrillar protein
  - sardine, storage effect on ATPase activity 183
- Nickel
  - (in) meat, determination 151
- Nisin
  - effect on meat, Clostridium, perfringens, germination 144
  - (in) food, determination 30
- Nitrate
  - (in) meat, determination 146
- Nitrite
  - effect on meat, Clostridium perfringens, germination 144
  - (in) food, determination 30
  - (in) meat, determination 146
- Nitrogen
  - effect on Ephestia cautella, egg 230
- Nitrosamine
  - (in) fish product, effect of broiling 178
  - toxicity 256
- Nutrition
  - documentation 248
  - education 245
- Nutritive value
  - chicken, meat mechanically deboned, 160
  - lamb, meat 156
  - milk, effect of heat treatment 126
  - triticale, debranning 67
- Oil
  - benzopyrene 211
  - gas-liquid chromatography, analysis 209
- Oleoresin
  - effect on pest 232
- Olive oil hydrocarbon
  - effect on cotton seed oil, stability 210
- Orange
  - juice, amino acid, effect of processing 99
- Orthogonal
  - spectrophotometry, utilization 31
- Ovosan
  - egg-shell washing 168
- Oxidation-reduction potential changes 16
  - fish, storage 177
- Packaging 19-21
  - paper, production, Italian regulation 23



- Palatability
  - pork, effect of microwave cooking rate 158
- Paprika
  - chlorine, analysis 217
  - ground, effect of ethylene oxide 218
  - ground, effect of irradiation 218
  - Hg analysis 217
  - irradiated, micronucleus test 216
  - potassium, analysis 217
  - Rb, analysis 217
  - Selenium, analysis 217
  - Zn, analysis 217
- Pasteurization
  - effect on streptococcus bacteriophages 116
- Pasteurized
  - egg, product, faecal streptococci survival 166
- Pathogenetic test
  - staphylococci 257
- Paunch
  - utilization 32
- Pecan
  - kernel, colour effect of iron 76
- Pectin
  - effect on grape, juice, extraction 91
- Pentachlorophenol
  - (fed) beef, dioxin level 155
- Pest
  - effect of oleoresin 232
- Pesticide
  - (in) America 233
  - industry 236
- pH
  - effect on grape, juice
  - effect on wine 198
- Phosalone
  - tomato, residue 83
- Phosphorous
  - buffalo milk, effect of sterilization 131
- Phosphine
  - toxicity, albino rat 238
- Pig
  - preslaughter stress 157
- Plant breeding
  - food, situation, contribution 16
- Pollution control
  - dairy industry 111
- Polyacrylamide gel electrophoresis
  - cow milk, characterization 127
- Polyol
  - protein, spectrometry analysis 37
- Pork
  - palatability, effect on microwave cooking rate 158
- Potassium
  - paprika, analysis 217
  - effect on grape, juice 198
- Potassium
  - effect on wine 198
- Potassium hydroxide
  - bacteria, differentiation 48
- Prawn
  - canned, spoilage 190
- Prefermentation treatment
  - effect on muscadine grape wine, quality 204
- Processed food
  - quality, effect of storage 227
- Processing
  - effect on orange, juice, amino acid 99
- Production
  - butter oil, ice cream utilization 135
  - citrus fruit 96
  - milk, cost 124
- Protein
  - (in) meat, determination 147, 149
  - polyol, spectrometry, analysis 37
  - tomato seed meal, availability 84
  - vegetable juice, availability, effect of endopolygalacturonase.
- Quail
  - slaughter, characteristics 165
- Quality
  - fish product, control 181
  - product, statistics 8
  - specification 5
- Quinalphos
  - tomato, residue 83
- Rat
  - liver enzyme, effect of chloroform 258
- Refrigeration
  - (of) food 226
- Remote sensing technology 6
- Residue
  - fentin, vegetable, spectrofluorimetry determination 77
- Rice
  - husk, utilization 66
- Rodenticide
  - bromadiolone, evaluation 246
- Salmonellae
  - sausage, production contamination 173
- Sardine
  - myofibrillar protein, storage, effect on ATPase activity 183
- Sausage
  - mortadella (by) non-meat animal protein 171
  - mortadella (by) vegetable protein 171
  - production, salmonellae contamination 173
  - water activity, determination 170
  - wiener type, quality 172
- Seafood
  - canned, TVN concentration, effect on meat, quality 175
  - fluoride content, determination 174
- Seaweed
  - arsenic, toxicity, evaluation 266



- Selenium  
  paprika, analysis 217
- Sensory evaluation  
  apple 103  
  triticale, debranning 67
- Serum uric acid level  
  effect of single cell protein 196
- Shell fish  
  aminotransferase  
    enzyme 176  
  canned, bisulphite residue 189
- Shogaol  
  ginger, gas chromatography, evaluation 215
- Single cell protein  
  (as) food 195  
  effect on serum uric acid level 196  
  effect on urine 196  
  production (from) sugar-cane bagasse (by) *Trichoderma longibrachiatum* 197
- Slaughter  
  quail, characteristics 165
- Sodium  
  effect on grape, juice 198  
  effect on wine 198
- Sodium chloride  
  (in) fish, absorption 179
- Solar energy  
  banana, drying 93
- Sorbic acid  
  citrus, juice, determination 97
- Sorghum  
  tannin, effect of cooking 71
- Sourage  
  milk, problem 123
- Soy extract  
  zabadi, enrichment 134
- Soy flour  
  nutrient, stability 106
- Spanish style solera  
  volatile concentration changes 208
- Spectrofluorimetry  
  vegetable, fentin, residue determination 77
- Spectrophotometry  
  food, calcium, content, analysis 39  
  orthogonal function 31  
  protein, polyol, analysis 37  
  water, calcium, content, analysis 39
- Spice  
  decontaminated, thermal analysis 212
- Spore  
  *Clostridium bifermentans*, effect of sporulation medium 53  
  effect on *Clostridium bifermentans*, spore 53
- Spray cleaning  
  chicken, faecal contamination 162
- Spray drying  
  effect on streptococcus bacteriophage 116
- Staphylococci  
  (in) cow milk 117  
  pathogenetic test 257
- Sterilization  
  effect on buffalo milk. phosphorous 131
- Storage  
  beef effect of microbial contamination 154  
  effect of beef, lysine content 153  
  effect on processed food, quality 227  
  fish, oxidation-reduction potential change 177  
  fruit 229  
  grain, Bangladesh 65  
  milk fish 188  
  sardine, myofibrillar protein, effect on ATPase activity 183  
  strawberry 94  
  vegetable 229
- Strawberry  
  bis-(trichloromethyl) disulfide-detection 95  
  storage 94
- Streptococcus bacteriophages  
  effect of pasteurization 116  
  effect of spray drying 116
- Sugar  
  legume, high pressure  
  liquid chromatography, estimation 72
- Sugar-cane bagasse  
  single cell protein, production (by) *Trichoderma longibrachiatum* 197
- Tannin  
  sorghum, effect of cooking 71
- Tartaric acid  
  fruit juice, high pressure liquid chromatography, determination 200
- Tea tannin  
  microsomal degranulation 202
- Temperature  
  effect on butter, butylated hydroxy-anisole, stability 136
- Texture  
  casein-carrageenan fibre, effect of coagulation bath 192  
  casein-carrageenan fibre, effect of freeze thaw cycle 193
- Thermal analysis  
  spice, decontaminated 212
- Tomato  
  concentrate 85  
  mechanical harvesting 86  
  phosalone, residue 83  
  quinalphos residue 83  
  seedmeal, protein availability 84
- Toxicity  
  nitrosamine 256  
  phospine, albino rat 238  
  seaweed, arsenic evaluation 266
- Transportation  
  fish, canned, biochemical change 182



- Trichoderma longibrachiatum  
   single cell protein, production  
   (from) sugar-cane bagasse 197  
 Triterpene alcohol  
   effect of cottonseed oil stabi-  
   lity 210  
 Triticale  
   debranned 68  
   debranning, nutritive value 67  
   debranning, sensory evaluation 67  
   yield, physiologic-genetic study  
   69  
 TVN concentration  
   seafood, canned effect on meat  
   quality 175  
 Turkey  
   carcasse, microbial examination  
   164  
 Urine  
   effect of single cell protein  
   196  
 Vegetable  
   fentin, residue, spectrofluori-  
   metry determination 77  
   juice, availability, effect of  
   endopolygalacturonase 79  
   mineral, evaluation 78  
   protein, sausage, mortadella 171  
   storage 229  
   vitamin, evaluation 78  
 Vibrio parahaemolyticus  
   (in) fish, contamination 180  
 Village level chilling (of) milk 113  
 Vitamin  
   vegetable, evaluation 78  
 Water  
   calcium, content, spectrophoto-  
   metry, analysis  
   Water (contd.)  
     chlorinated, effect on meat 145  
   Water activity  
     sausage, determination 170  
   Water binding capacity  
     (in) meat measurement 152  
   Wheat  
     flour, proteolysis 70  
     flour, quality 70  
   Whey  
     lactose, production 138  
     yeast, propagation 42  
   Wine  
     acetate, enzymic analysis 199  
     continuous fermentation review 205  
     effect of pH 198  
     effect of potassium 198  
     effect of sodium 198  
     Egyptian, chemical composition 207  
     grape, quality 90  
     methyl anthranilate 206  
     (of) muscadine grape, quality  
     effect of prefermentation treat-  
     ment 204  
   Yeast  
     cheddar cheese whey, alcohol, prod-  
     uction 140  
     contamination, lipid, analysis 41  
     grapemust, growth 45  
     mineral, content 49  
     propagation and handling 50  
     (in) whey, propagation 42  
   Yoghurt  
     zabadi, soy extract, enrichment 134  
   Zabadi (See) Yoghurt  
   Zinc  
     paprika, analysis 217







